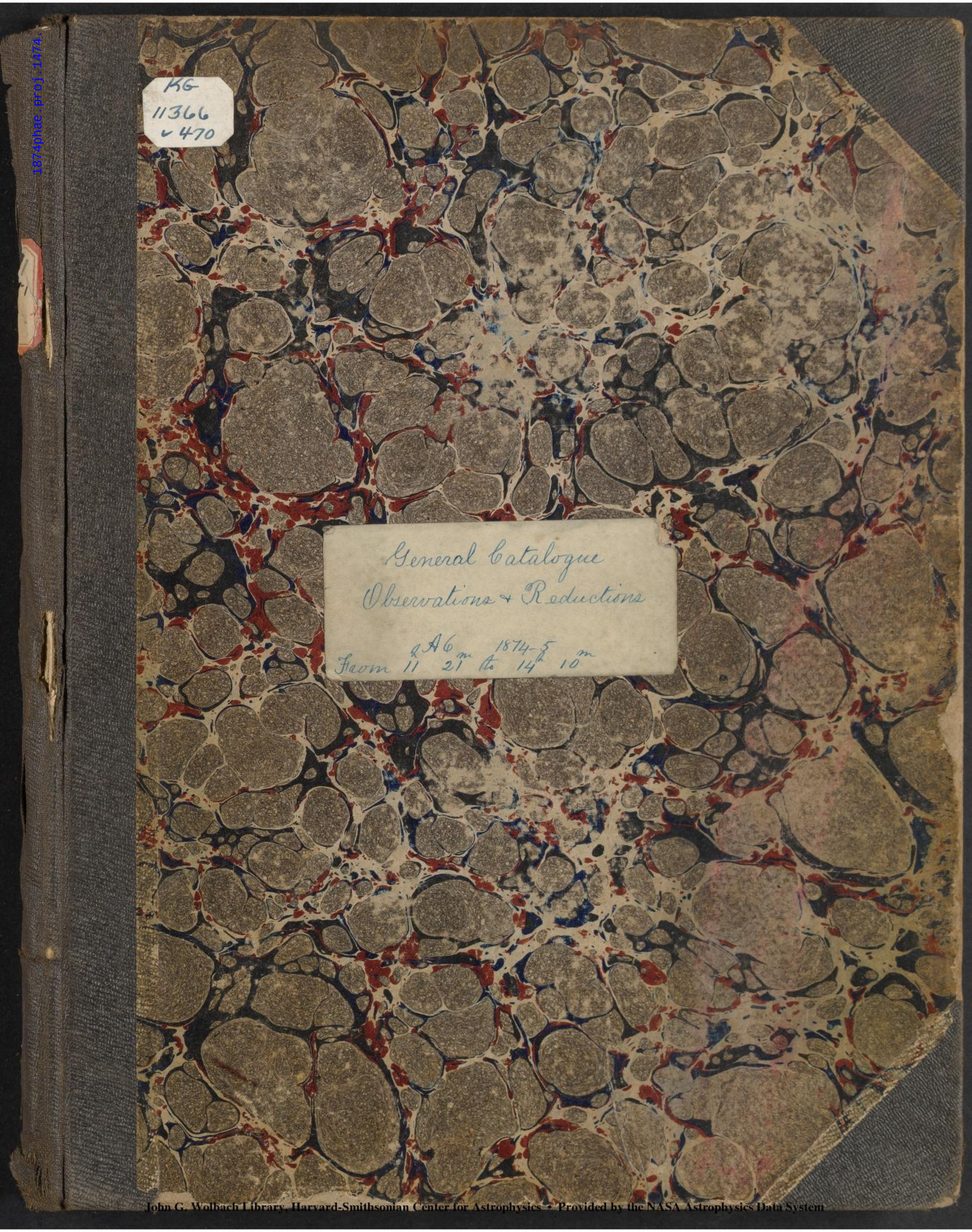
KG
11366
v 470



General Catalogue
Observations & Reductions

A6 1874-5
From 11^h 21^m to 14^h 10^m

G.C. 1874-5

Observations & Reductions

A 6

From $11^h 21^m$ to $14^h 10^m$

1874

τ Leonis.
h m sec.
11 21 30
+3° 33′
φ = +38° 50′
sin z +63

L
δ
dα/dT
dδ/dT

l cos δ 9.99917
l b .10992
l b′ .10909
l sin δ 8.79 183

cos α =
cos δ =
tang δ = +.06
I = 2.07 s
K = −.015 s

1874

Apr. 30		May 5		May 10		May 12		May 14		May 19	
−.053		.152		.199		.100		.287		.265	
20 43.1	20 31.3	20 —	20 56.6	20 34.7	20 25.7	20 32.5	20 —	20 30.7	20 23.6	20 27.9	20 21.6
45.2	33.0	—	58.8	36.4	28.0	34.6	—	32.8	25.8	30.1	24.0
47.3	35.0	—	10	38.7	30.0	36.6	—	34.8	27.7	32.1	25.6
51.5		47.2		42.8		40.7		38.9		36.2	
53.6		49.2		44.9		42.8		41.1		38.3	
55.6		51.3		47.1		45.0		43.1		40.3	
57.6	21 18.3	53.3		49.2	21 6.2	47.0	20 59.4	45.2	21 9.8	42.5	21 12.6
59.6	20.3	55.4		51.2	8.0	49.1	1.4	47.2	12.3	44.4	14.4
3.9	22.2	—		53.3	10.2	51.1	3.4	51.3	13.8	48.6	16.2
6.0		—		55.4		55.2		53.4		50.6	
8.0		—		57.3		57.4		55.5		52.7	
4314 180 6114		2564		5170		4940		4740		4437	
	20 33.10		20 58.84		20 27.90		1.		20 25.70		23.73 20 23.40
20 55.582	21 20.27	20 51.280		20 47.000	21 8.13	20 44.909	201 1.40	20 43.091	21 11.97	20 40.336	21 14.40
55.567		51.265		46.985		44.894		43.076		40.321	
+ 33.08		+ 37.28		+ 41.49		+ 42.56		+ 45.35		+ 48.08	
— .03		— .01		— .01		— .01		— .02		— .01	
— 1.14 +1.917		— 1.12 +1.967		— 1.08 +2.007		— 1.06 +2.027		— 1.05 +2.037		— 1.00 +2.087	
+ 31.91		+ 36.15		+ 40.40		+ 42.49		+ 44.28		+ 47.07	
20 55.54		20 57.26		20 46.98		20 44.89		20 43.08		20 40.32	
21 27.48		21 27.41		21 27.38		21 27.38		21 27.36		21 27.39	
21 30.567		30.497		30.467		30.467		30.447		30.477 27.340	

	Apr. 30		May 5		May 10		May 12		May 14		May 19	
C m − δ	+ 22.48 s	− 24.69	− 7.52		+ 19.10	− 21.13	+ ~~4~~3.51		+ 17.39	− 28.88	.61 + 16.~~94~~	− 34.06
Circle Di.	55′		55		55		55 − 16.49		55		55	
	− 1.97		− 2.06		− 2.13		− 2.16		− 2.19		− 2.20	
micros.	3 51.4		4 25.9		3 52.8	4 45.0	4 35.2		3 55.0	4 54.1	3 55.1	0 1.1
	58.3		40.0		5.3	58.0	49.7		18.7	18.7	6.4	12.7
	109.7″		65.9		118.1	103.0	84.9		133.7	132.8	121.5	13.8
	58′ 54.85		59 32.95		58 59.05	59 51.50	59 42.45	42.45	59 6.85	0 6.40	59 0.75	0 6.90
	1.35180	1.39252	0.87622 n		1.28126	1.32490 n	1.63859 n	1.21722 n	1.24030	1.46060 n	1.23891	1.53224 n
	1.46089	1.50161	0.98531 n		1.39035	1.43399 n	1.74768 n	1.32631 n	1.34939	1.56969 n	1.33800	1.64133 n
	+ 28.90	− 31.74	− 9.67		+ 24.57	− 27.16	+ 55.93	− 21.20	+ 22.35	− 37.12	+ 21.78	− 43.79
	59 23.75		59 23.28		59 23.62	59 24.34	0 38.38	59 21.26	59 29.20	59 29.28	59 22.53	59 23.11
+3°	23′ 24.60″		23 25.07		23 24.73	24.01	23 27.10		23 19.15	19.07	23 25.82	25.24
	23 24.60		25.07		24.37		27.10		19.11		25.53	
+	38 48 38		49 16		48 42	49 34					48 44	49 50
	1.66540		1.66560		1.66540	1.66557					1.66540	1.66570
	+ 741		+ 523		+ 896		+ 857		− 554		− 271	
	1.67281		1.67083		1.67436	1.67466	1.67369	1.67420	1.65986	1.66016	1.66269	1.66299
	− 47.08		− 46.86		− 47.25	− 47.28	− 47.20	− ~~47.24~~	− 45.69	− 45.73	− 45.99	− 46.02
	− .02	~~−.05~~ −.10 −.03	− .01	~~−.05~~ −.10	− 2	− 2	− 1					
	− .08		− .09		− .02 − .08	− .11 − .02 − .10	− .01 − .38	~~−.19~~ − .39	− .01 − .33	− .20 − .04 − .01	− .01 − .32	− .20 − .06 − .01
	− 47.18		− 46.96		− 47.35	− 47.40	− 47.59		− 46.03	− 45.78	− 46.32	− 46.09
+3	22 37.42		22 38.11		22 37.38	36.61	22 39.51		22 33.12	33.29	22 39.50	39.15
	+ 10 18.53	17.29	+ 10 18.70	17.41	+ 10 19.87	18.53	+ 10 17.36	16.00	+ 10 22.47	21.10	+ 10 16.07	14.69
	− 1.24	− 13.61	− 1.29	− 13.84	− 1.34	− 14.09	− 1.36	− 14.20	− 1.34	− 14.31	− 1.38	− 14.59
	+ 6.14		+ 5.94		+ 5.69	1.60	+ 5.58		+ 5.47	59.69	+ 5.19	59.38
	+ 10 23.16		+ 10 23.35		+ 10 24.22	0.83	+ 10 21.58		+ 10 26.57	59.86	+ 10 19.88	59.03
	33 0.88		1.46		1.22		1.09		32 59.77		59.20	
	32 41.10		42.68 1		41.44		41.31		39.99		39.42	

1875
21 30.54
32 40.24
+ 3.087
− 19.78

8 9.99917
.12552
16' .12469

1875

April 27		May 3		May 17	
−.182		−.234		−.340	
21 18.6	21 10.7	21 18.8	21 7.7	21 17.7	21 8.9
20.7	12.6	20.9	9.5	19.6	11.0
22.8	14.3	23.0	11.5	21.7	12.5
26.9		27.0		25.9	
29.0		29.2		27.9	
31.0		31.2		30.1	
33.1	31 51.0	33.3	21 53.4	32.1	21 50.4
35.2	53.0	35.4	55.6	34.1	52.5
39.3	55.2	39.4	57.5	38.2	54.4
41.4		41.5		40.2	
43.4		43.7		42.3	
				8	
3414		3434		3299	
	21 12.53		21 9.57		21 10.80
21 31.036	21 53.07	21 31.218	21 55.50	21 ~~29.971~~ 82	21 52.43
31.021		31.203		29.967	
+ 0.99		+ 0.76		+ 1.92	
− .01		− .01		− .02	
− 1.51		− 1.46		− 1.34	
− 0.53		− 0.71		+ 0.56	
21 31.02		21 31.20		21 29.97	
21 30.49		21 30.49		21 30.53	
				30.503	
s + 18.51	− 22.03	+ 21.65	− 24.28	+ 19.18	− 22.45
30	30		30		
− 3.01		− 2.78		− 2.26	
2 48.2	3 43.0	2 45.2	3 46.5	2 48.0	3 43.7
1.1	54.9	56.0	57.1	2.4	57.4
109.3	97.9	101.2	103.6	110.4	101.1
32 54.65	33 48.95	32 50.60	33 51.80	32 55.20	33 50.55
1.26741	1.34301 a	1.33546	1.38525 n	1.28285	1.35122 n
1.39210	1.46769 n	1.46015	1.50994 n	1.40754	1.47591 a
+ 24.67	− 29.35	+ 28.85	− 32.35	+ 25.56	− 29.92
33 19.32	33 19.60	33 19.45	33 19.45	33 20.76	33 20.53
49 29.03	28.75	49 28.90	28.90	49 27.59	27.82
28.89		28.90		27.70	
49 7	50 11			49 7	50 2
1.66550	1.66580			1.66550	1.66580
+ 934		+ 292		+ 376	
1.67484	1.67514	1.66842	1.66872	1.66926	1.66956
− 47.30	− 47.33	− 46.60	− 46.64	− 46.69	− 46.73
− .01 − .35	− .02	− .02 − .36	− .03	− .02 − .32	− .02
− .29	− .38	− .28	− .39	− .26	− .34
− 47.60	− 47.73	− 46.90	− 47.06	− 46.97	− 47.09
48 41.43	41.02	48 42.00	41.84	48 40.62	40.73
− 16 8.28	10.17	− 16 8.23	9.98	− 16 6.87	8.29
− 1.89		1.75		1.42	
+ 8.11	39.37	+ 7.85	39.87	+ 7.14	39.47
− 16 2.06	38.96	− 2.13	39.71	− 1.15	39.58
32 39.16		39.79		39.52	
	39.17		39.79		39.53

λ Draconis.
h m sec.
11 23 58
° '
+70 1

ζ = − 27° 38
ζ sin z − 486

1874
α $53^s.952$
δ +1' 33".91
$\frac{d\alpha}{dt}$ +3^s.638
$\frac{d\delta}{dt}$ −19".840

log cos δ 9.53370
log b .10992
log b' 9.64362

log sin δ 9.97303

corr α = +.087
corr δ =

log f = +2.75 − 2.92
I = 6.02 s
k = −.041

1874	m	s		r	"	
Apr 30	23	58.08		0	105.2	
May 5		57.87	−.21		106.1	+.9
10		57.66	.21		106.8	.7
15		57.43	.23		107.4	.6
20		57.20	.23		107.9	.5
25		56.96	.24		108.3	.4
30		56.41	.25		108.6	.3

+ 1874 April 30 −.07 −.053 × May 5 −.15 −.152 × May 10 −.20 +.199 + May 12 −.06 −.04 −.100 × May 14 −.25 −.05 +.287 × May 19 −.18 −.08 −.265

23 13.2 22 48.0 23 9.3 22 27.4 23 4.6 22 18.6 23 2.2 22 16.0 23 0.7 22 37.6 22 58.0 22 17.1
16.2 54.5 12.3 32.8 7.6 23.6 5.8 20.7 3.8 43.6 0.8 24.0
19.1 0.1 15.1 36.5 10.8 27.4 8.2 26.1 7.1 48.2 3.7 28.8
22.2 18.1 13.9 11.4 9.9 6.9
25.0 21.0 17.3 14.3 13.0 10.2
28.3 24.0 19.8 17.6 16.0 13.0
31.3 23 58.2 27.2 23 32.3 22.9 23 47.9 20.4 23 33.8 19.0 23 18.3 16.0 23 21.1
34.3 0.2 30.2 37.1 25.8 53.7 23.5 40.5 22.1 24.4 19.0 28.0
37.3 5.6 33.3 44.0 29.0 59.1 26.5 46.1 25.0 29.5 22.1 33.2

6
22.59 19.05 15.17 12.94 11.66 14.97
60
25.100 21.167 16.856 14.378 12.956 8.97
22 54.20 22 32.23 22 23.20 22 20.93 22 43.13 22 23.30
23 25.100 23 59.67 23 21.167 23 37.80 23 16.856 23 53.57 23 14.378 23 40.13 23 12.956 23 24.07 23 9.967 23 27.43
.211

25.170 +33.06 21.126 +37.30 16.842 15 +41.53 14.337 +43.62 12.915 +45.44 9.926 +48.16
23 58.077 −.19 23 57.886 −.41 23 57.645 −.55 23 57.580 −.17 23 57.497 −.69 23 57.268 −.50
−32.920 −36.753 −40.834 −43.242 −.12 −44.585 −.15 −47.330 −.23
−32.99 −4.12 −36.82 −3.91 −40.903 −3.70 −43.31 −3.61 −44.64 −3.52 −47.39 −3.28
23 53.92 54.11 54.10 54.06 54.00 54.08
.10
+ 33.08 + 37.28 + 41.50 + 43.54 + 45.35 + 48.09
− .14 − .42 − .55 − .28 − .79 − .73
− 4.12 −.482 − 3.91 −.272 − 3.70 −.062 − 3.61 +.028 − 3.52 +.118 − 3.28 +.358
+ 28.82 51 25.43 + 32.95 25.46 + 37.25 24.77 + 39.68 28.32 + 41.04 25.42 + 44.08 30.88
23 25.17 +10 19.05 23 21.13 +10 19.15 23 16.81 +10 19.85 23 14.34 +10 17.89 23 12.91 +10 22.92 23 9.93 +10 16.17
+ 1.1 + 1.0 + 1.0 + 1.0 + 1.0 + 1.0
23 53.99 −11.30 23 54.08 −12.20 23 54.06 −12.90 23 54.02 −13.20 23 53.95 −13.40 23 54.01 −13.90
57.628 70 1 34.28 57.718 1 33.41 57.698 1 32.72 57.658 1 34.01 57.588 1 35.94 57.648 1 34.15

31.01 46 2
+ ~~33.90~~ − 34.57 + 48.94 − 16.63 + 53.66 − 36.71 + 53.45 − 25.75 + 29.83 − 11.11 + 46.67 − 17.46
30 30 30 30 30 30
− 1.97 − 2.06 − 2.13 − 2.16 − 2.19 − 2.20
1 39.1 2 8.3 1 27.0 1 57.5 1 25.7 2 6.3 1 23.7 1 57.9 1 31.5 1 45.7 1 23.9 1 53.0
40.2 8.9 34.7 4.9 34.1 14.8 30.3 5.1 49.4 6.9 29.0 56.7
79.3 17.2 61.7 122.4 59.8 21.1 54.0 123.0 80.9 112.6 52.9 109.7
31 39.65 32 8.60 31 30.85 32 1.20 31 29.90 32 10.55 31 27.00 32 1.50 31 40.43 31 56.30 31 26.45 31 54.85

1.4746
1.49160 1.53732n 1.68966 1.22089n 1.72965 1.56478n 1.72796 1.41078n ~~1.60021~~ 1.04571n 1.66904 1.24204n
1.13512 1.18094n 1.73328 0.86451n 1.37327 1.20840n 1.37157 1.05440n ~~1.24382~~ 0.68933 1.31266 0.88566n
2154 11.53
+13.65 −15.17 ~~+54.11~~ −7.32 +23.62 −16.16 +23.53 −11.34 ~~+14.53~~ −4.89 +20.54 −7.68
31 53.30 31 53.43 32 ~~24.96~~ 31 53.88 31 53.52 31 54.39 31 50.53 31 50.16 31 ~~57.98~~ 31 51.41 31 46.99 31 47.17
1 54.35 53.58

+69° 50 55.05 54.92 51 ~~23.39~~ 50 54.47 50 54.83 53.96 50 57.82 58.19 50 ~~50.37~~ 56.94 51 1.36 1.18
54.98 55.96 54.89 58.05 54.77 1.27
55.21 55.85

−27 38 37 38 8
1.47930n 1.47910n
+745 +527 +902 +864 −554 −256
1.48675 1.48655 1.48457 1.48428 1.48832 1.48812 1.48794 1.48774 1.47376 1.47356 1.47674 1.47654
+30.67 +30.66 +30.52 +30.50 +30.78 +30.77 +30.76 +30.74 +29.77 +29.76 +29.97 +29.96

−.17 −.22 −.20 −.41 −.26 −.04 −.50 −.40 −.23 −.49 −.43 −.11 −.16 −.19 −.02 −.38 −.35 −.06
−.03 −.04 −.03 −.04 −.03 −.04 −.11 −.16 −.06 −.15 −.11 −.15
+30.47 +30.42 +30.08 +30.42 +30.25 +30.50 +30.16 +30.47 +29.55 +29.59 +29.48 +29.75
51 25.52 25.34 51 26.04 24.89 51 25.08 24.46 51 27.98 28.66 51 24.32 26.53 51 30.84 30.92
1 45.2 46.1 46.8 47.1 47.3 47.8
+10 19.7 19.9 20.1 21.2 21.7 22.3 19.1 18.4 23.0 20.8 17.0 16.5
+10 19.8 20.6 22.0 18.6 21.9 17.0
+10 18.53 1 33.65 +10 18.70 33.48 + 19.87 33.02 + 17.36 33.13 + 22.47 34.39 + 16.07 34.01
+ .90 19.43 33.47 + .94 19.64 32.33 + .97 20.84 32.40 + .99 18.35 33.81 + 1.00 22.47 36.60 + 1.00 17.07 34.10
−31.14 −32.04 −32.74 −33.04 −33.24 −33.74
− 11.30 − 12.20 − 12.90 − 13.20 − 13.40 − 13.90
+10 8.13 1 33.56 + 7.44 32.90 + 7.94 32.71 + 5.15 33.47 + 10.07 35.49 + 3.17 34.0
1 13.72 13.06 12.87 13.63 15.65 14

1875 4

s m s ' "

α 57.590 Apr 30 23 62.33 0 83.4

δ +1 14.07 May 5 62.12 -.21 84.2 +.8

$\frac{d\alpha}{dt}$ +3.637 10 61.91 .21 85.0 .8

$\frac{d\delta}{dt}$ -19.841 15 61.68 23 85.6 .6

20 61.45 23 86.2 .6

l cos δ 9.53370

l c .12552

l c' 9.65922

1874.0

α δ

53.99

54.08

54.06

54.02

53.95

54.01

54.19

54.043

53.952 33.91

+.091

1875.0

α δ

57.72

83

58

57.710

.590 14.07

+.120

X 1874 1875

-28 -19 -23 -82

May 24 April 27 May 3 May 17

~~-268~~ -.272 -.182 -.234 -.340

22 53.4 22 20.5 23 23 12.0 23 23 1.7 23 23 29.7

58.5 24.5 49.9 16.9 50.3 9.0 48.8 36.1

1.6 31.5 53.0 19.9 53.3 13.9 37.7 40.4

4.6 56.1 56.3 54.3

7.5 59.0 59.3 57.5

10.5 1.9 24 0.7 2.3 24 34.0 0.5

13.5 23 13.9 5.2 5.7 5.6 39.5 3.9 24 17.8

16.5 19.9 8.5 12.0 8.4 45.0 6.7 22.3

19.4 23.3 11.3 11.4 9.6 27.9

14.2 14.7 12.6

1875 2591 2916 2456

120 240 240 240

67.5 22 25.50 191 23 16.27 216 23 8.13 56 23 35.40

23 7.500 23 19.03 24 2.122 24 6.13 24 2.400 24 39.50 24 0.622 24 22.67

+1.05

7.459 +50.56 2.081 ~~+1.005~~ 2.359 +0.79 0.581 +1.92

23 57.020 -77 24 2.474 -52 24 2.268 -63 24 1.6058 -88

-49.564 -0.396 +0.1007 -1.020

-49.63 -3.05 -0.45 -4.85 -0.02 -4.64 -1.09 -3.99

5420 5776 5788 5763

+ 50.53 + 0.99 + 0.76 + 1.92

- .75 - .50 - .65 - .93

- 3.05 +0.587 - 4.85 - 4.64 - 3.99

+ 46.73 51 3.087 - 4.36 17 2.988 - 4.53 3179 - 3.00 3113

23 ~~57.00~~ 7.46 +101626 24 2.08 -16 77.6 24 2.36 -16 786 24 0.58 -16 647

+10 +13 +12 +11

23 54.19 -1430 23 57.72 -890 23 57.83 -980 23 57.58 -1180

57.828 1 33.83 1 14.52 1 15.33 1 13.96

+ 40

s -11.53

+42.00 ~~-17.46~~ +45.85 -4.01 +54.27 -37.10 +25.22 -22.05

30 5 5 5

1 -2.19 -3.01 -2.78 -2.26

1 25.0 1 49.7 0 21.0 0 44.3 0 14.9 0 57.6 0 27.9 0 49.1

31.1 54.8 34.6 58.0 27.4 10.3 45.0 5.0

56.1 104.5 55.6 102.3 42.3 127.9 72.9 114.1

31 28.05 31 52.25 5 27.80 5 51.15 5 21.15 6 13.95 5 36.45 5 57.05

1.62325 1.06183 ~~1.24204~~ 1.66134 0.60314n 1.73456 1.56937n 1.40175 1.34341n

1.26687 0.88566n 1.32056 0.26236n 1.39378 1.22859n 1.06697 1.00263n

72145

+18.49 ~~-7.68~~ -15.26 +20.92 -1.83 +24.76 -16.93 +11.50 -10.06

31 46.54 31 44.51 4699 5 48.72 5 49.32 5 45.91 5 47.02 5 47.95 5 46.99

51 1.81 1.58 1.36 16 59.63 59.33 59.03 17 2.44 1.88 17 1.33 17 0.40 0.88 1.36

38 49 38 25 38 20 37 57 38 12 37 51

1.47930n 1.47920n 1.47920n 1.47910n 1.47920n 1.47910n

-812 +943 +301 +386

1.47118 1.47108 1.48863 1.48853 1.48221 1.48211 1.48306 1.48296

+29.59 +29.59 +30.81 +30.80 +30.35 +30.35 +30.41 +30.41

-.31 30 -.02 -.35 -.25 1 -.51 -.46 44 -.24 -.11 -.16 -.08

-.12 -.15 -.05 -.09 -.03 -.10 -.05 -.08

+29.16 +29.42 +30.41 +30.46 +29.81 +30.01 +30.25 +30.25

51 30.97 30.78 17 30.04 29.73 17 32.25 31.34 17 30.65 31.61

48.2 1 23.0 23.9 25.9

+10 17.2 17.4 +16 7.0 6.7 +16 8.4 7.4 +16 4.7 5.7

+10 17.3 -16 6.9 7.9 5.2

+10 16.04 +10 27.1 -16 8.28 -16 15.80 - 8.23 - 16.76 - 6.87 - 17.64

+ 1.00 17.01 33.68 + 1.38 6.90 14.24 + 1.27 6.96 15.49 + 1.03 5.84 13.01

- 14.30 34.14 33.49 - 8.90 13.93 - 9.80 14.58 - 11.80 13.97

1 33.58 1 14.08 15.03 13.49

1 13.74

1874

B.A.C. 3928.

11h 26m 34sec.

−31° 10′

Z = + 73° 33′

Z sin z = +.96

l cos δ 9.93230
l 6 .10992
l 6′ .04222

l sin δ 9.71393n

corr α =
corr δ =

tang δ = −.61

I = 2.41s

K = −.018s

1874

Apr. 30		May 5		May 10		May 12		May 14		May 19	
−.053		−.152		−.199		−100		−.287		−.265	
11 26 22.2 4.4 6.7 11.5 14.0 16.5 18.8 21.3 26.1 28.4 30.9	26 40.0 6.1 9.4 26 41.6 45.9 48.8	25 57.7 0.2 2.6 7.2 9.7 12.0 14.4 17.0 21.7 24.2 26.5	25 45.2 48.4 50.3 26 40.1 43.1 45.6	25 53.5 33.7 58.6 2.9 5.3 7.8 10.1 12.5 17.2 19.8 22.2	25 84.7 37.4 40.0 26 18.7 21.1 23.0	25 51.1 53.5 55.9 0.9 3.2 5.6 8.6 10.5 15.2 17.7 20.0	25 46.0 48.3 50.4 26 31.5	25 49.2 51.7 54.1 59.0 1.2 3.7 6.1 8.4 13.3 15.8 18.0	25 35.4 37.0 39.0 26 14.8 16.8 18.9	25 — — — 55.9 58.5 0.9 3.4 5.8 — — —	26 9.1 10.6 11.7
1808		1932 60		2650 180		2422 180		2805 240		1245 120	
26 16.436 16.418	26 6.50 26 45.43	1332 26 12.109 12.091	25 47.97 26 42.93	850 26 7.727 7.709	25 37.37 26 20.93	622 26 5.655 5.637	25 48.23 26 31.50	405 26 3.682 3.664	25 37.13 26 16.83	45 26 0.900 0.882	26 10.43
+ 33.09 + .03 − 0.98 +1.939 + 32.14 26 16.42		+ 37.28 + .09 − 0.93 +2.009 + 36.44 26 12.09		+ 41.50 + .12 − 0.87 +2.069 + 40.75 26 7.71		+ 43.57 + .06 − 0.85 +2.089 + 42.78 26 5.64		+ 45.35 + .17 − 0.82 +2.114 + 44.70 26 3.66		+ 48.09 + .16 − 0.76 +2.179 + 47.49 26 0.88	
26 48.56 51.499		26 48.53 51.469		26 48.46 51.399		26 48.42 51.359		26 48.36 51.295		26 48.37 51.309	

+ 9.94	− 28.99	+ 24.14	− 30.82	+ 30.36	− 13.20	+ 17.42	− 25.85	+ 26.55	− 13.15		− 9.53
35		35		35		35		35		35	
−1.67		−2.06		2.13		−2.16		2.19		−2.20	
4 27.2	0 5.0	4 8.0	0 7.1	4 2.9	~~4 46.0~~	4 13.1	0 1.0	4 10.0	4 55.0	4 49.1	
36.8	17.7	22.8	23.7	17.2	0.6	29.3	18.7	36.1	22.1	1.8	
640	227	308	308	201	1066	424	197	461	1371	1109	
39′ 32.00″	40 11.35	39 15.40	40 15.40	38 10.15	~~39 53.30~~	39 21.20	40 9.85	39 23.05	39 8.55	39 55.45	
0.99739	1.46225n	1.38274	1.48883n	1.48230	~~1.12057n~~	1.24105	1.41246n	1.42406	1.11898n		0.97909n
1.03961	1.70447n	1.42496	1.53105n	1.52452	~~1.16279n~~	1.28327	1.45468n	1.46628	1.16115n		1.02131n
+ 10.96	− ~~20.08~~ 31.58	+ 26.66	− 33.97	+ 33.46	− 14.55	+ 19.20	− 28.49	+ 29.26	− 14.49		− 10.50
39 42.96	39 ~~45.97~~ 39.402	39 42.06	39 41.43	38 43.61	~~39 38.75~~	39 40.40	39 41.36	39 52.31	39 54.06	39 44.95	
−31° 16′ 54.61″ 52.83	~~57.62~~ 51.65	16 53.71 53.39	53.08	16 54.26 54.26	~~16 50.40~~	16 52.05 52.53	53.01	17 03.96 4.83	57	16 56.60	
+73 30 45	30 6										
2.28350	2.28318										
+750		+532		+909		+872		−554		−246	
2.29100	2.28068	2.28882	2.28850	2.29259	2.29227	2.29222	2.29190	2.27796	2.27760	2.28104	2.28072
−195.43	−195.29	−194.46	−194.32	−196.15	−196.01	−195.99	−195.84	−189.66	−189.52	−191.00	−190.86
− 3	− 3	− 4	− 4	− 2	− ~~2~~	− 2	− 2	− 7	− 7	− 4	− .04
+ 2 +.05	+19	+14 +.13	+.22	+.22 ~~+.04~~	+ ~~.07~~	+.07 −.06	+16	+16 −.23	+.04	+ 12 −.37	+ .02
−.09	−.01	−.09	−.01	−.07 +.15	− ~~.10~~	−.34	−.02	−.35	−.32	−.39 −.37	− .39
−3 15.53	−3 ~~15.11~~	−3 14.41	−3 14.15	−3 16.08	~~−3 16.08~~	−3 18.28	−3 15.72	−3 9.92	−3 9.87	−3 11.41	−3 11.27
−31 20 10.14	−3 15.14 6.19	20 8.16	7.23	19 10.28	6.49	20 8.33	8.73	20 13.88	15.58	20 8.01	20 7.87
+10 18.53	16.64	+ 18.70	16.73	+ 19.87	17.83	+ 17.36	15.29	+ 22.47	20.37	+ 16.07	13.96
− 1.89	−6.59	− 1.97	−5.12	− 2.04	−4.73	− 2.07	−4.61	− 2.10	−4.50	− 2.11	−4.26
+ 14.28	9 39.22	+ 14.75	36.68	+ 15.14	37.31	+ 15.26	37.78	+ 15.34	38.14	+ 15.61	~~41.84~~
+10 30.92	35.27	+ 31.48	35.75	+ 32.97	~~33.62~~	+ 30.55	39.18	+ 35.74	39.84	+ 29.57	~~41.40~~
9 37.24		36.22		~~35.52~~		37.98		38.99		~~41.77~~	~~38.30~~ 38.30
9 57.11		56.09		~~55.59~~ 57.18		57.85		58.86		~~61.64~~	58.11

1875
α, 26 51.35
δ, 9 58.70
dα/dt + 2.939
dδ/dt − 19.87

log cos δ' 9.93230
l.C .12552
l.C' .08782

1874 1875

May 26 April 27 May 3 May 17 May 26

-.280 -.182 -.234 -.340 -.552

11 25 43.2 25 31.4 26 37.1 26 38.1 26 37.4 26 48.1 26 36.0 26 31.4 26 34.5 26 27.9
45.6 34.0 39.6 38.5 39.4 50.2 38.4 34.0 36.9 30.1
48.0 36.1 42.0 40.7 42.1 40.8 36.5 39.3 32.8
52.8 46.6 47.0 45.5 44.2
53.2 49.0 49.3 47.9 46.6
57.6 51.5 51.7 50.5 49.0
0.0 26 25.6 54.0 27 14.9 54.1 27 25.9 52.7 27 9.3 51.4 27 13.4
2.5 27.5 56.4 17.0 56.4 28.5 53.2 53.8 15.2
7.3 29.4 1.1 19.8 1.4 31.1 0.0 58.6 17.6
9.7 3.5 3.7 2.3 1.0
12.2 6.0 6.2 4.8 3.4

33 41 38 68 389 0 37 41 41 87
300 180 180 180 120
634 1 25 33.83 566 8 26 38.43 569 0 26 49.15 554 1 26 33.97 538.7 26 30.27
25 57.645 26 27.50 26 51.527 27 17.23 26 51.727 27 28.43 26 50.373 27 9.30 26 48.973 27 15.20
57.627 51.509 51.709 50.355 48.955

+ 51.34 + 0.99 + 0.76 + 1.92 + 3.22
+ .17 + .11 + .14 + .21 + .34
− 0.64 +2.269 − 1.26 − 1.20 − 1.04 − 0.93
+ 50.84 − 0.156 − 0.30 + 1.09 + 2.63
25 57.63 26 51.51 26 51.71 26 50.35 26 48.95

26 48.47 26 51.365 26 51.41 26 57.44 26 51.58
51.409
48.453 51.448

δ
+ 23.81 − 29.86 + 13.10 − 25.70 + 2.58 − 36.70 + 16.40 − 18.93 + 18.70 − 26.23
35 10 10 10 10
− 2.18 − 3.01 − 2.78 − 2.26 − 2.09
4 15.1 0 13.4 3 14.5 3 59.9 3 31.0 4 16.0 3 14.5 3 54.9 3 20.2 4 11.2
30.0 30.2 27.7 13.5 43.8 26.3 28.5 8.6 44.0 33.9
45.1 43.6 42.2 133.4 74.8 42.3 43.0 123.5 64.2 45.1
39 22.55 40 21.80 13 21.10 14 6.70 13 37.40 14 21.15 13 21.50 14 1.75 13 32.10 14 22.55

1.37673 1.47509n 1.11727 1.40993n 0.41162 1.56467n 1.21484 1.27715n 1.27184 1.41880n
1.41898 1.51734n 1.17509 1.46975n 1.48944 1.62249n 1.27266 1.33497n 1.32966 1.47662n
+ 26.24 − 32.91 + 14.96 − 29.36 + 2.95 − 41.93 + 18.74 − 21.62 + 21.36 − 29.97
39 48.79 39 48.89 13 36.06 13 37.34 13 41.35 13 39.22 13 40.24 13 40.13 13 53.46 13 52.58

17 0.44 0.54 50 47.71 48.99 50 53.00 50.87 50 51.89 51.78 51 5.11 51 4.23
0.49 48.35 51.93 51.83 4.67
30 54 29 55 30 27 29 41 30 16 29 26
2.28354 2.28309 2.28337 2.28300 2.28328 2.28286
− 733 + 954 + 312 + 397 − 1470
2.28809 2.27576 2.29291 2.29264 2.28645 2.28612 2.28734 2.28698 2.26858 2.26816
− 188.89 − 188.70 − 196.30 − 196.13 − 193.42 − 193.25 − 193.80 − 193.63 − 185.60 − 185.42
− 4 − 4 − 4 − 4 − 2 − 2 − 2 − 2 − .10 − .10
− .14 − .17 − .21 − .04 − .47 − .16 − 0 − .55 − .32 − .06 − .40 − .08 − .08 − .47 − .16
00 00 − 33 − 41 − 36 − 43 − 31 − 36 − 31 − 40
− 3 9.07 − 3 8.95 − 3 16.71 − 3 16.74 − 3 13.80 − 3 14.08 − 3 14.19 − 3 14.09 − 3 6.09 − 3 6.08
20 9.51 9.49 54 4.42 5.73 54 6.80 4.89 54 6.08 5.87 54 11.20 54 10.31
+ 10 17.85 15.76 − 16 8.28 11.16 − 8.23 ~~11.09~~ 10.89 − 6.87 9.03 − 3.47 5.47
− 2.09 − 4.04 − 2.88 − 2.66 − 2.16 − 2.00
+ 15.83 37.92 + 15.77 9 59.81 + 16.39 61.30 + 17.38 57.73 + 17.68 59.81
+ 10 31.59 37.90 − 15 55.39 1.12 − 54.50 59.39 − 51.65 57.52 − 47.79 58.10
9 37.91 9 60.47 60.34 57.63 58.55
9 57.78

B.A.C. 3934.
11h 28m 26sec.
−32° 10′
ζ = + 74° 33′
sin ζ = +.96

1874
α
δ
$\frac{d\alpha}{dt}$
$\frac{d\delta}{dt}$
l cos δ 9.92763
l b .10992
l b′ .03755
l sin δ 9.72622n

1875
28 2528
10 1159
+2.915
− 19.10
9.92763
.12552
.05310

cons =
cons =
tang δ = −.63
I = 2.44 s
k = −.019 s

1874 — 1875

May 5 | May 10 | May 12 | May 14 | May 19 | April 27

f .152 | f .199 | f .100 | f .287 | f .265 | f .182

27 — 28 5.0 27 — 28 0.4 27 24.8 — 27 23.0 27 12.3 27 20.2 27 8.5 28 10.8 28 15.1
— 7.5 — 2.7 27.2 — 25.4 15.6 22.7 10.8 13.2 17.2
— 11.0 — 4.5 29.7 — 27.8 17.0 25.1 12.8 15.6 19.7
41.0 36.9 — 32.7 30.0 20.5
43.5 39.4 — 35.1 32.5 23.0
45.8 41.9 — 37.6 34.8 25.5
48.4 29 44.3 — 27 53.1 40.1 28 4.7 37.3 27 55.0 27.8 28 54.2
50.8 46.5 — 55.1 42.4 6.6 39.8 57.8 30.3 56.3
— — 49.3 57.1 47.5 9.2 44.7 0.1 35.1 59.4
— — 51.6 49.8 47.1 37.5
— — 53.7 52.2 49.5 40.0

2295 28 7.83 2090 28 2.53 4138 27 14.97 3837 27 10.70 2793 28 17.33
27 45.900 27 41.800 39.383 27 55.10 27 37.618 28 6.83 27 34.882 27 51.63 28 25.391 28 56.70
27 39.364

45.881 41.781 39.364 37.599 34.863 25.372

+ 34.29 + 41.50 + 43.57 + 45.35 + 48.09 + 0.99
+ .09 + .12 + .06 + .18 + .17 + .11
− 0.95 +1.965 − 0.88 +2.035 − 0.85 +2.065 − 0.83 +2.085 − 0.77 +2.145 − 1.26
+ 36.43 + 40.74 + 42.78 + 44.70 + 47.49 − 0.16
27 45.88 27 41.78 27 39.36 27 37.60 27 34.86 28 25.37

28 22.31 28 22.52 28 22.04 28 22.30 28 22.35 28 25.21
25.225 25.435 ~~24.955~~ 25.05 25.215 25.265
22.304

−21.93 −20.73 cuit −15.74 +22.65 −29.21 +24.18 −22.75 +8.06 −31.31
~~40~~ 35 ~~40~~ 35 ~~30~~ 5 35 35 10
−2.06 −2.13 −2.16 −2.19 −2.20 −3.01
~~0~~ 4 56.9 4 55.6 4 48.2 4 15.3 0 11.9 4 11.7 0 3.4 3 18.6 4 4.9
14.7 12.2 6.1 41.3 39.9 23.4 14.3 31.7 17.6
1316″ 1278 1143 566 518 351 177 503 225
40 5.80 ~~45~~ 40 3.90 3 ~~4~~ 9 57.15 39 28.30 40 25.90 39 17.55 40 8.85 13 25.15 14 11.25

1.34104n 1.31660n 1.19700n 1.35507 1.46553n 1.38346 1.35698n 0.90634 1.49568n
1.37859n 1.35415n 1.23455n 1.39262 1.50308n 1.42101 1.39453n 0.95949 1.54883n
−23.91 −22.60 −17.16 +24.70 −31.85 +26.35 −24.80 +9.11 −35.39
~~40~~ 39 41.89 ~~40~~ 39 41.30 3 ~~4~~ 9 39.99 39 53.00 39 54.05 39 45.90 39 44.05 13 34.26 13 35.86
−32° 1 ~~7~~ 6 53.54 ~~21~~ 16 52.95 16 51.64 17 4.65 5.17 5.70 16 55.55 55.62 55.70 50 45.91 46.71 47.51
+74 30 00 74 29 37 30 23
~~1.56100~~ 2.31099 2.31080n 2.31118n

+535 +912 +876 −554 −241 +958
2.31634 2.32011 2.31975 2.30545 2.30858 2.32038 2.32076
−207.17 −208.98 −208.81 −202.05 −202.05 −203.51 −203.51 −209.11 −209.30
− 5 − 3 − 2 − .10 − .10 − 4 − 4 − 3 − 3
+.11 ~~+.04~~ +.10 ~~+.04~~ +.06 ~~.11~~ +.12 −.03 +.20 +.14 −.04 +.12 + 2 .25 +.23
−.02 +.09 −.01 +.09 −.39 −.33 −.36 −.03 −.34 −.01 −.34 −.42
−3 27.13 −3 28.92 −3 ~~28.50~~ 29.16 −3 22.39 −3 21.98 −3 23.75 −3 23.44 −3 29.46 −3 29.52
20 20.67 20 ~~25~~ 21.84 ~~55~~ 20 ~~20.14~~ 20.80 20 27.04 27.68 20 19.30 19.14 54 15.37 17.03
+10 18.70 16.73 + 19.87 17.83 + 17.36 15.29 + 22.47 20.37 +10 16.07 13.96 −16 8.28 11.16
− 1.97 −4.14 − 2.04 −3.74 − 2.07 −3.60 − 2.10 −3.47 − 2.14 −3.21 − 2.88
+14.96 +15.36 +15.50 +15.63 +15.89 +12.94
+10 31.69 9+ 33.19 + 30.79 + 36.00 5104 + 29.85 −15 55.22
51.68 10 10.59
9 (~~10~~) 48.98 (~~14~~) 48.68 (4) ~~49.35~~ 50.01 ~~9 51.04~~ 9 51.36 9 49.45 12.25
10 8.08 10 7.78 10 ~~8.45~~ 9.11 ~~10 10.14~~ 10 10.46 10 8.55 10 11.42

May 3 May 17

-.237 -.340

28 7.10 28 9.3 28 – 28
13.3 12.2 –
15.7 14.6 –
20.7 19.2
23.0 21.8
25.5 24.2
28.0 28 52.1 26.6
30.4 54.1 29.5
35.3 56.6 –
37.7 –
40.0
28.06
~~25.09~~ 28 12.03 12.13
28 ~~25.536~~ 28 54.23 28 24260
25.509

25.490 24241

+ 0.46 + 1.92
+ .15 + .21
– 1.20 – 1.05
– 0.29 + 1.08
28 25.49 28 24.24

28 25.20 28 25.82

25.243

8
+13.48 –28.72
10 10
–27.8 –22.6
3 16.2 4 4.0 3 45.6
27.2 16.1 1.4
43.4 20.1 107.0
13 21.70 14 10.05 13 53.50

1.12969 1.45818
1.18284 1.51138
+15.24 –32.46
13 36.94 13 37.59

50 48.59 49.24
48.91
29 34 30 22
2.31080 2.31118
+317
2.31397 2.31435
–.20605 –206.23
– 7 – 2
+.04 ~~–.21~~ +19
–.34 ~~–.18~~ –.42 –.35
–3 26.37 –3 26.48
54 14.96 15.72
–16 8.23 10.89 –6.87
– 2.66 –2.16
+16.59 – +17.65
–15 54.30 51.38
9.26
16.02

10 9.64

v Leonis.
h m sec.
11 30 33
− 0° 8′
ζ = + 42° 31′
sin ζ = +.67

1874

Apr. 30	30m 31.00s		7′	49.7″	
May 5	30.96	−.04		49.5	−.2
10	30.92	.04		49.3	.2
15	30.88	.04		49.1	.2
20	30.84	.04		48.9	.2
25	30.80	.04		48.7	.2
30	30.75	.05		48.4	.3
June 4	30.71	.04		48.2	.2
9	30.66	.05		47.9	.3

1874
l, 29.827
δ′ −7 42.35
dα/dT +3.071
dδ/dT −19.847

l cos δ 0.00000
l b .10992
l b′ .10992
l sin δ 7.36682n

corr α = +.005s
corr δ = +.55″
l ang δ = −00 100
I = 2.06s
K = −.015

	× 1874 −.15 May 5 −.152		× −.20 May 10 −.199		× −.06 May 12 −.100	−.04	+ −.25 May 14 +.287	−.05	× −.18 May 19 −.265	−.08	× −.28 May 26 −.280	
	29 41.3	29 31.0	29 37.2	29 27.2	29 35.0	29 27.5	29 —	29 40.0	29 —	29 24.0	29 27.2	29 15.8
	43.4	32.8	39.2	29.4	37.0	29.5	—		—	25.8	29.2	17.9
	45.4	34.2	41.2	32.2	39.1	31.4	—		—	27.2	31.2	19.9
	49.5		45.2		43.2		41.4		38.6		35.3	
	51.7		47.4		45.3		43.4		40.8		37.3	
	53.7		49.5		47.3 49.5		45.5		42.9		39.3	
	55.7	30 16.1	51.5	30 6.2	51.5	30 5.8	47.6		44.9	30 0.6	41.6	30 5.1
	57.9	18.4	53.7	7.3	55.6	7.7	49.7		46.9	3.3	43.7	7.0
	1.0	21.0	57.9	8.2	57.7	9.8	—		—	4.7	47.6	8.9
	4.1		59.8		59.8		—		—		49.7	
	6.2		1.9				—		—		51.8	
			4845									
	41 09		48 8 5		52 10		22 76		21 41		43 39	
	180		60									
	59 0 9	29 32.67	54 45	29 29.60		29 29.47		29 40.00		29 25.67		29 17.87
	29 53.718	30 18.50	29 49.864	30 7.23	29 47.364	30 7.77	29 45.520		29 42.820	30 2.87	29 39.445	30 7.00
	53.703	+37.30	500 49.485	+41.53	47.349	+43.62	45.505	+45.43	42.805	+48.16	39.430	+51.36
	30 30.96	.00	30 30.92	.00	30 30.90	.00	30 30.89	.00	30 30.85	.00	30 30.79	.00
	−37.26		−41.44		−43.55	−.04	−45.39	−.05	−48.05	−.08	−51.36	
		−1.13		−1.09		−1.07		−1.06		−1.02		−0.96
	+ 37.29	30 29.87	+ 41.50	29.93 ×2	+ 43.57	29.86	+ 45.35	29.82	+ 48.09	29.86	+ 51.34	29.83
	+ .00		+ .00	.92	+ .00		+ .00		+ .00		+ .00	
	− 1.13	+1.941	− 1.09	+1.981	− 1.07	+2.001	− 1.06	+2.011	− 1.02	+2.051	− 0.96	+2.111
	+ 36.16		+ 40.41		+ 42.50		+ 44.29		+ 47.07		+ 50.38	
	29 53.70	18 7.36	29 49.48	6.64	29 47.35	5.05	29 45.50	11.56	29 42.80	4.52	29 39.43	4.94
		+10 19.15		+10 19.85		+10 17.89		+10 22.92		+10 16.17		+10 17.66
	30 29.86	−1.5	30 29.89	−1.4	30 29.85	−1.5	30 29.79	−1.4	30 29.87	−1.4	30 29.81	−1.4
	32.961	+7.20	32.961	+7.00	32.921	+6.90	32.861	+6.80	32.941	+6.60	32.881	+6.40
	−0 3	87 42.51		87 41.19		7 41.76		7 43.24		7 43.15		7 42.28
			19.90	.73								
	+21.05	−24.78	+ ~~20.26~~	−17.87	+17.89	−20.41	+5.52		+17.15	−20.05	+21.57	−27.56
	35		35		30		35		35		35	
	−2.06		−2.13		−2.16		−2.19		−2.20		−2.18	
	4 26.8	0 25.7	4 27.4	0 15.4	4 28.5	0 16.9	4 47.0		4 32.3	0. 19.7	4 27.0	0 28.0
	43.0	43.4	43.6	32.5	43.9	34.9	13.9		43.8	32.7	41.1	44.4
	69.8	69.1	71.0	47.9	72.4	51.8	120.9		76.1	52.4	68.1	72.4
	39 34.90	40 34.55	39 35.50	40 23.95	39 36.20	40 25.90	39 0.45		39 38.05	40 26.20	39 34.05	40 36.20
	1.32325	1.39410n	1.29885	1.24871n	1.25261	1.30984n	0.74194		1.23426	1.30211n	1.33385	1.44028n
	1.43317	1.50402n	1.40877	1.35862	1.36253	1.41976n	0.85186		1.34418	1.41203n	1.44377	1.55020n
	+27.11	−31.92	+25.63	−22.84	+23.04	−26.29	+7.11		+22.09	−25.83	+27.78	−35.50
	40 2.01	40 2.63	40 1.15	40 1.11	39 59.24	39 59.61	39 7.56?		40 0.14	40 0.37	40 1.83	40 0.70
− 0°	17 13.65″	14.28	17 12.78	12.76	17 10.89	11.26	17 19.21?		17 11.79	12.02	17 13.48	12.35
	13.96		12.77		11.07				11.90		12.91	
+42	29 18	30 18									29 17	30 19
	1.72180	1.72200									1.72180	1.72200
	+539		+917		+883		−554		−233		−720	
	1.72719	1.72739	1.73097	1.73117	1.73063	1.73083	1.71626	1.71646	1.71947	1.71967	1.71460	1.71480
	−53.36	−53.38	−53.82	−53.85	−53.78	−53.81	−52.03	−52.05	−52.42	−52.44	−51.83	−51.86
	+.07 −.02	+.03	+.02 −.03	+.01	+.01 −.18	+.02	+ 0 ~~−.16~~		+.01 −.18	+.02	+.02 −.18	+.04
	−.09	−.01	−.09	−.01	−.37	−.03	−.32 −.32		−.37	−.03	−.37	−.05
	−53.43	−53.36	−53.89	−53.85	−54.14	−53.82	−52.35		−52.78	−52.45	−52.18	−51.87
	18 7.08	7.64	18 6.67	6.61	18 5.03	5.08	18 11.56		18 4.57	4.47	5.66	4.22
	7 49.5		49.3		49.2		49.1		48.9		48.7	
	+10 17.6	18.1	+10 17.4	1 17.3	+10 15.8	15.9	22.5		+10 15.7	15.6	17.0	15.5
	+10 17.85		17.35		15.85				15.65		16.25	
	+10 18.4	7 42.56	17.9	41.22	16.4	42.21			16.2	43.37	16.8	42.87
	+10 18.70	17.32 43.12	+ 19.87	18.45 41.16	+ 17.36	15.92 42.26	+ 22.47	21.01	+ 16.07	14.60 43.27	+ 17.85	16.39 41.43
	− 1.38	−12.65	− 1.42	−12.85	− 1.44	−12.95	− 1.46	−13.05	− 1.47	−13.25	− 1.46	−13.45
	+ 7.20	7 42.84	+ 7.00	41.19	+ 6.90	42.23	+ 6.80	43.75	+ 6.60	43.32	+ 6.40	42.15
	+10 24.52	8 2.69	+ 25.45	1.04	+ 22.82	2.08	+ 27.81	3.60	+ 21.20	3.17	+ 22.79	2.00

1875 5

		m	s		° ′	″	
Apr.	30	30	34.39		8	11.5	
May	5		34.35	-.04		11.4	-.1
	10		34.31	.04		11.2	.2
	15		34.27	.04		11.0	.2
	20		34.22	.05		10.8	.2
	25		34.18	.04		10.6	.2
	30		34.13	.05		10.3	.3
June	4		34.09	.04		10.1	.2
	9		34.04	.05		9.8	.3

1875

α 32.898 s

δ -8′ 22.0

$\frac{d\alpha}{dT_0}$ +3.071

$\frac{d\delta}{dT}$ -19.847

l. cos δ .00000

l. 6 .12552

l. 6′ .12552

1875

-19 April 27 -187				-23 May 3 -237				-55 May 26 -552			
30	21.1	30	13.7	30	21.3	30	19.0	30	18.8	30	12.0
	23.1		15.8		23.3		21.5		20.8		13.8
	25.2		17.6		25.3		22.9		22.8		16.0
	29.3				29.4				27.0		
	31.4				31.5				29.0		
	~~33.5~~				33.6				31.0		
	35.6	30	54.6		35.6	30	57.6		33.0	30	47.5
	39.6		56.9		39.9		59.2		35.0		49.0
	41.6		58.7		41.9		1.3		39.2		51.2
	43.7				43.9				41.3		
	45.8				46.0				43.3		
	36.79	30	15.70		36.95	30	21.13		34.13	30	13.93
30	33.445	30	56.73	30	33.591	30	59.37	30	31.027	30	49.23
	33.430		1.05 +~~0.05~~		33.576		+0.79		31.012		+3.24
30	34.41		+.00	30	34.356		.00	30	34.17		.00
	-0.98				-0.778				-3.16		
			-151				-146				-127
+	0.99	30	32.97	+	0.76		32.91	+	3.22		32.98
+	.00			+	.00			+	.00		
-	1.51			-	1.46			-	1.27		
-	0.52			-	0.70			+	1.95		
30	33.43	52	339	30	33.58		280	30	31.01		681
		-16	7.76			-16	7.86			-16	3.35
30	32.91		-1.9	30	32.88		-1.7	30	32.96		-7.6
			+9.40				+9.30				+8.40
	-0	8	3.65			8	3.06			8	3.36

10 + 17.74	- 23.29	10 + 12.46	- 25.78	10 + 17.10	- 18.20
- 3.01		-2.78		-2.09	
3 28.5	4 22.8	3 36.4	4 2~~46~~.7	3 30.9	4 17.1
39.9	33.4	46.0	31~~56~~.9	51.4	38.8
68.4	56.2	82.4	83.6	82.3	55.9
13 34.20	14 28.10	13 41.20	14 ~~51~~.80 31.	13 41.15	14 27.95
1.24895	1.36717n	1.09552	1.41128n	1.23300	1.26007n
1.37457	1.49269n	1.22104	1.53680n	1.35852	1.38559n
+ 23.69	- 31.09	+ 16.64	- 34.40	+ 22.83	- 24.30
13 57.89	13 57.01	13 57.84	57.40	14 3.98	14 3.65
51 9.54 9.10	8.66	51 9.49 9.27	19.05	51 15.63 15.46	15.30
29 46	30 40			29 53	30 40
1.72190	1.72210			1.72190	1.72210
+967		+326		-1452	
1.73157	1.73177	1.72516	1.72536	1.70738	1.70758
- 53.90	- 53.92	- 53.11	- 53.13	- 50.98	- 51.00
+.01 -.38	+.03	+.01 -.41	+.03	+.01 -.35	+.01
-.36	-.45	-.37	-.49	-.33	-.40
-54.25	-54.34	-53.47	-53.59	-51.30	-51.39
52 3.79	3.00	52 2.76	2.64	52 6.93	6.69
8 11.6		11.5		10.6	
-16 7.8	8.6	-16 8.5	8.9	-16 7.7	8.9
-16 8.20		8.70		8.80	
-16 7.7	4.68	8.2	3.75	8.2	2.40
-16 8.28	10.29 3.89	- 8.23	10.09 3.43	- 3.47	4.87 2.16
- 2.01		- 1.86		- 1.40	
+ 9.40	8 4.28	+ 9.30	3.59	+ 8.40	2.28
-16 0.89		-16 0.79		-15 5.47	

57

γ Cephei L.C.
h m sec
23 h 34 14
+103° 4'
76 56
ζ = − 60° 41
sin ζ = −.87

1874 s "
May 5 6.27 29.4
10 34m 6.71 +.44 55' 28.8 −.6
15 7.17 +.46 28.4 −.4
20 7.64 .47 28.1 .3
25 8.13 .49 28.0 .1
30 8.63 .50 28.0 .0

1874
α 11.462
δ +55 44.46 = 4 15.5
dα/dt +2.403
dδ/dt +20.070

cons. +113
const =
log δ = −4.31 444
I = 9.10
κ = +.069

l cos δ 9.35427n
l C .10992
l C' 9.46419n
l sin δ 9.98861

9.34288
6.43672
6.07960

× 1874 −.15 × −.20 × −.06 −.04 × −.25 −.05 × −.18 −.08 × −.28
May 5 May 10 May 12 May 14 May 19 May 26
−.152 −.199 −.100 −.284 −.265 −.280

33 9.7 32 17.0 33 6.0 32 20.0 33 4.5 32 14.9 33 2.2 32 45.4 33 0.3 32 18.8 32 57.8 32 17.6
14.3 20.1 10.6 28.6 9.0 21.9 6.7 5.0 24.7 2.3 22.7
19.0 30.5 15.0 38.0 13.5 30.2 11.2 9.1 34.5 6.9 32.5
23.2 19.7 18.6 15.5 13.7 11.6
27.6 23.8 22.8 20.5 18.5 15.9
32.8 28.6 27.2 25.0 22.7 20.6
37.4 33 39.2 33.0 31.8 33 36.8 29.3 33 44.8 27.5 33 5.8 24.9
41.7 38.0 36.2 34.0 32.2 14.5 29.7
47.0 42.5 41.4 38.8 36.4 20.7 34.2

2527 2172 2053 1832 1654 2039
60
32 22.53 32 28.87 32 22.33 32 45.40 32 26.00 1439 32 24.27
33 28.078 33 39.20 33 24.133 33 22.811 33 36.80 33 20.356 33 44.80 33 18.378 33 13.67 33 15.989

28.147 +37.29 24.202 +41.53 22.880 +43.62 20.425 +45.43 18.447 +48.17 16.058 +51.36
34 6.2925 +.65 34 6.7469 +.86 34 6.8387 +.26 34 7.076 +1.08 34 7.4852 ~~+1.78~~ 34 8.1620 +1.21
−38.7410 −42.5449 −43.9599 +.18 −46.5944 +.22 −49.0307 +.36 −52.1014
−38.21 +5.21 −42.60 +4.77 −44.10 +4.59 −46.75 +4.40 −49.18 +3.94 −52.25 +3.26
34 34 11.30 11.36 11.53 11.58 5 11.70 11.89
+ 37.29 + 41.50 + 43.54 + 45.35 :55 + 48.09 + 51.34
+ .65 + .86 + .43 + 1.24 + 1.14 + 1.21
+ 5.21 +7.613 + 4.77 +7.173 + 4.59 +6.993 + 4.40 6.803 + 3.94 +6.343 + 3.26 +5.663
+ 43.15 54 690 + 47.13 607 + 48.59 996 + 50.99 520 + 53.17 1356 + 55.81 1065
33 28.15 +10 1915 33 24.20 +10 1985 33 22.88 +10 1789 33 20.42 +10 2292 33 18.45 +10 1617 33 16.06 +10 1766
+ 2.2 + 2.1 + 2.1 + 2.1 + 2.0 + 2.0
34 11.30 103 −1520 34 11.33 −1580 34 11.47 −1580 34 11.41 −1600 34 11.62 −1640 34 11.87 −1650
13.703 ~~104~~ 4 13.05 13.733 4 12.22 13.873 4 14.15 13.813 4 14.22 14.023 4 15.33 14.273 4 13.81

+65.55 −11.12 +55.26 +60.48 −13.99 +34.96 −24.44 +52.38 +4.71 +51.72
30 30 30 30 30 30
−2.06 −2.13 −2.16 −2.19 −2.20 −2.18
0 42.5 0 20.0 0 40.8 0 15.1 0 38.6 0 16.1 0 26.9 0 9.9 0 31.9 0 18.0 0 32.0
45.9 23.7 45.2 19.5 42.8 20.5 41.4 24.0 32.1 18.0 35.0
88.4 43.7 86.0 34.6 81.4 36.6 68.3 33.9 64.0 36.0 67.0
30' 44.20 30 21.85 30 43.00 30 17.30 30 40.70 30 18.30 30 34.15 30 16.95 30 32.00 30 18.00 30 33.50

1.81657 1.04610n 1.74241 1.78161 1.14582n 1.54354 1.38810n 1.71917 0.67302 1.71366
1.28076n 0.51029 1.20660n 1.24580n 0.61001 1.00776n 0.85229 1.18326n 0.13721n 1.17785n
−19.09 +3.24 −16.09 −17.61 +4.07 −10.18 +7.12 −15.25 −1.37 −15.06
30 25.11 30 25.09 30 26.91 30 23.09 30 22.37 30 23.97 30 24.07 30 16.75 30 16.63 30 18.44

~~+102° 52'~~ 23.24" 23.26 21.44 52 25.26 25.98 24.38 24.28 31.60 31.72 28.91
103 52 23.25 25.62 24.33 31.66
−60 39 33 39 55 39 45 39 59
2.00892n 2.00901n 2.00895n 2.00904n
+546 +925 +893 −554 −220 −706
2.01438 2.01447 2.01817 2.01826 2.01785 2.01794 2.00438 2.00347 2.00675 2.00684 2.00189 2.00198
+103.37 +103.39 +104.27 ~~+104.29~~ +104.20 +104.22 +100.78 +100.80 +101.57 +101.59 +100.44 +100.46
+ .01 +.01 .00 .00 .00 .00 + .01 + .01 .00 .00 + .01
+ .52 +.26 +.02 + .37 .36 + .44 + .33 +.13 +.02 +.16 +.07 +.06 +.34 +.30 +.32 + .34 .29 +.34
39
−.01 −.01 −.01 −.01 −.06 −.02 −.05 −.02 −.04 −.02 .00
+1 43.89 +1 43.41 +1 44.63 +1 ~~44.72~~ +1 44.47 +1 44.22 +1 40.90 +1 40.85 +1 41.87 +1 41.89 +1 40.74
54 7.13 6.67 6.09 9.73 10.20 5.28 5.13 13.47 13.66 10.65
55 29.43 28.87 28.7 28.5 28.1 28.0
4 30.7 31.3 31.3 31.5 31.9 32.0
+10 23.6 24.0 25.2 21.6 21.1 26.2 26.4 18.4 18.2 21.4
+10 23.8 12.82 25.2 21.3 ~~12.46~~ 13.16 26.3 13.85 18.3 ~~14.65~~ 15.05 21.4
+10 18.70 20.49 11.56 9 + 19.87 21.72 + 17.36 19.23 13.23 6 + 22.47 24.37 13.80 5 + 16.07 17.98 ~~14.64~~ + 17.85 19.74
+ 1.79 −35.67 + 1.85 −36.27 9 + 1.87 −36.27 + 1.90 −36.47 + 1.91 −36.87 15.24 + 1.89 −36.97
− 15.30 4 ~~11.79~~ 12.19 − ~~16.20~~ 1580 11.59 − ~~16.20~~ 1580 ~~12.49~~ 13.40 16.50 13.47 − 16.40 ~~14.74~~ 15.15 − 16.50 13.81
+10 4.80 5.29 3 ~~5.42~~ 52.12 5.52 51.52 92 3.83 ~~5.42~~ 53.33 ~~4.97~~ 8.37 53.50 + 1.78 ~~54.07~~ 55.18 2.81 3.24 53.82

1875					
Apr. 30	24m	8.11 s		55	52.0	
May. 5		8.53	+.42		51.3	-.7
10		8.97	.44		50.8	.5
15		9.43	.46		50.4	.4
20		9.91	.48		50.1	.3
25		10.40	.49		50.0	.1
30		10.90	.50		50.0	.0

1875
α 13.866 s
δ +56 4.53 3 5547
$\frac{d\alpha}{d\tau}$ +2.404
$\frac{d\delta}{d\tau}$ +20.070

l cos δ 9.33427
l c ,12552
l c' 9.47979

1874.0 α	δ	1875.0 α	δ
11.30		13.88	
33		13.90	
47		14.03	
41		14.34	
62		13.80	
87			
11.500		13.990	
.462	44.46	.866	4.53
+.038		+.124	

1875

-19		-23		-43		-49		-55	
April 27		May 3		May 22		May 23		May 26	
-.182		-.237		-.425		-.500		-.552	
33	32 57.1	33	33 9.0	33	33 24.1	33	33 49.6	33	32 49.8
49.8	5.0	48.4	15.6	47.8	29.1	47.7	53.3	46.7	54.6
52.2	11.9	52.8	23.2	52.1	36.0	52.2	59.0	51.4	4.2
54.0		54.4		56.7		56.4		56.1	
34 1.5		34 2.0		34 1.6		34 0.7		34 0.7	
6.1		6.6		5.8		5.7		4.4	
10.2	34 3.8	11.1	34 0.9	10.4	34 3.2	10.0	34 12.7	8.3	34 10.2
15.4		15.3	4.9	15.1		15.0	17.7	12.9	
19.8		21.3	17.1	19.2		18.9	25.5	18.7	
24.2		24.8		24.4		23.9		23.4	
2342		2387		2331		2305		2226	
180	3	180		180		180		180	
542	32 4.67	587	33 15.93	331	33 29.73	505	~~33 53.97~~	426	32 57.20
34 6.022	34 3.80	34 6.522	34 7.63	34 5.900	34 3.20	34 5.611	34 18.63	34 4.733	34 10.20
	+1.06								
6.091	~~+0.06~~	6.591	+0.79	5.969	+2.45	5.680	+2.81	4.802	+3.24
34 7.825	+.82	34 8.324	+.99	34 10.048	+1.85	34 10.137	+2.11	34 10.437	+2.37
-1.776		-1.775		-4.071		-4.459		-5.637	
-1.87	+6.02	-1.86	+5.53	-4.22	+3.79	-4.60	+3.70	-5.78	+3.40
	34 13.99		13.90		14.06		14.30		13.81
+0.99		+0.76		+2.44		+2.80		+3.22	
+.78		+1.02		+1.83		+2.16		+2.38	
+6.02		+5.53		+3.79		+3.70		+3.40	
+7.79	20 10.16	+7.31	12.80	+8.06	12.27	+8.66	10.60	+9.00	9.62
34 6.09	-16 9.76	34 6.59	-16 7.86	34 5.97	-16 5.57	34 5.68	-16 4.80	34 4.80	-16 3.35
	+2.4		+2.2		+1.9		+1.9		+1.9
34 13.88	-12.20	34 13.90	-12.90	34 14.03	-14.40	34 14.34	-14.50	34 13.80	-14.50
103(?)43	52.60		3 54.24		3 54.20		3 53.20		3 53.67
s +61.35	+2.22	+50.52	-1.11	+30.17	+2.70	+11.64	-13.02	+67.53	-5.47
0		0		0		0		0	
-3.01		-2.78		-2.17		-2.13		-2.09	
4 32.0	4 14.0	4 25.2	4 9.4	4 12.2	4 1.2	4 ~~27.1~~	4 0.1	4 23.1	3 1.7
50.2	31.3	42.0	25.7	38.0	26.9	53.1	26.9	52.2	30.0
82.2	45.3	67.2	35.1	50.2	28.1	80.2	27.0	75.3	31.7
4 41.10	4 22.65	(4 33.60?)	4 17.55	4 25.10	4 14.05	4 ~~40.10~~	4 13.50	4 37.65	3 (4) 15.85
1.78781	0.34635	1.70346	0.04532n	1.55835	0.43136	~~1.06545~~	1.11461n	1.82950	0.73799n
1.26760n	9.82614n	1.18325n	9.52541	1.03814n	9.91543n	0.54574n	0.59440	1.30929n	0.21778
-18.52	-0.67	-15.25	+0.33	-10.92	-0.81	~~-3.51~~	+3.93	-20.38	+1.65
4 22.58	4 21.98	4 18.35?	4 17.88	4 14.18	4 13.24	4 ~~36.59~~	4 17.43	4 17.27	4 17.50
18 25.78	18 26.37	30.00	30.47	34.17	35.11	31.76	30.92	31.08	30.85
26.07		30.23		34.64		~~31.84~~		30.96	
39 7	39 25							39 10	39 32
2.00875n	2.00887n							2.00881n	2.00890n
+980		+340		-1794		-873		-1438	
201855	201867	201215	201227	199081	199093	200002	200014	199443	199452
+104.36	+104.40	+102.84	+102.87	+97.91	+97.93	+100.01	+100.03	+98.72	+98.75
.00	.00	.00	.00	+.02	+.02	+.01	+.01	+.02	+.02
+.34 -.28	+ 0	+.32 -.28	+ 0	+.17 -.30	+ 0	+.02 -.38	+.02	+.55 -.10	+.08
-47	-44	-46	-43	-40	-38	-42	-38	-41	-39
+1 44.23	+1 43.96	+1 42.70	+1 42.44	+1 37.90	+1 37.57	+1 39.62	+1 39.68	+1 38.88	+1 38.93
20 10.00	20 10.53	12.70	12.91	11.87	12.68	(51.38)	10.60	×9.96	9.28
55 52.43		51.56		50.1		50.0		50.0	
4 9.7		8.4	-	9.5	-	10.0		10.0	
-(16) 2.3	2.6	4.3	4.5	2.0	2.8		0.6	0.0	59.3
-16 2.4	3 52.13	4.4	53.98	2.4	53.74		0.6	59.7	~~55.76~~ 53.80
-16 8.28	52.46	- 8.23	54.19	- 5.61	54.55	- 5.14	3.29	- 3.47	-1.66 ~~44.8~~ 53.12
+ 2.61	5.67	+ 2.41	5.82	+ 1.88	37.3	+ 1.85		+ 1.81	
- 12.20	3 52.30	- 12.90	54.08	- 14.40	54.14	- 14.50	52.81	- 14.50	~~55.12~~ 53.46
-16 17.87		18.72		18.13		17.79		-16.14	

!

6

3 Draconis

11h 35m 29sec

1874 +67° 26'

cos α = +.036s
cos δ = +.38"
Long δ = +2.40
I = 5.36s
1875 K = -.038s

	1874		1875
α	25.631s		29.040s
δ	+26' 31.22"	_25° 3' Sing -.42	+26 11.31
dα/dt	+3.410		+3.409
dδ/dt	-19.906		-19.906

1874		α 35m		δ 26'	
Apr.	30	29.44s		41.0"	
May	5	29.26	-.18	42.0	+1.0
	10	29.08	.18	42.8	.8
	15	28.89	.19	43.5	.7
	20	28.70	.19	44.1	.6
	25	28.50	.20	44.6	.5
	30	28.30	.20	44.9	.3
June	4	28.09	.21	45.1	.2
	9	27.87	.22	45.3	.2

1875		α 35m		δ 25'	
Apr	30	33.42s		79.1"	
May	5	33.24	-.18	80.1	+1.0
	10	33.06	.18	80.9	.9
	15	32.87	.19	81.6	.7
	20	32.67	.20	82.2	.6
	25	32.47	.20	82.7	.5
	30	32.27	.20	83.0	.3
June	4	32.06	.21	83.2	.2
	9	31.84	.22	83.4	.2

l cos δ 9.58406 — 9.58406 — l sin δ 9.96541
l b .10992 — .12552
l b' 9.69398 — 9.70958

1874: × -20 May 10 -199 | × -28 May 26 -280 | 1874 × -22 May 27 +283
1875: -19 April 27 -182 | -23 May 3 -234 | -49 May 23 -500

11 34 37.3 35 17.5 | 34 27.0 34 15.8 | 34 26.6 34 50.2 | 35 34 51.4 | 35 1 34 58.6 35 4.0 | 35 35 16.0
40.0 22.0 | 29.8 16.8 | 29.1 53.8 | 21.8 56.6 | 22.2 7.9 | 19.9 21.2
42.6 27.8 | 32.6 18.3 | 32.0 0.1 | 24.5 0.1 | 24.9 | 22.8 26.0
45.2 | 35.2 | 34.7 | 27.5 | 27.7 | 25.8
47.8 | 38.1 | 37.5 | 30.1 | 30.4 | 28.5
50.9 | 40.5 | 40.1 | 33.0 | 32.6 | 31.0
53.3 35 38.0 | 43.4 34 53.5 | 42.8 35 22.7 | 35.4 35 42.4 | 35.8 35 45.0 | 33.9 35 59.0
56.1 44.2 | 45.9 58.4 | 45.5 28.1 | 38.2 46.4 | 38.9 49.3 | 36.3 72
59.0 49.6 | 48.7 3.6 | 48.1 32.3 | 41.0 52.8 | 41.0 53.8 | 39.0 12.2
44.0 | 44.0 | 41.6

43.22 35 22.43 | 34.12 34 16.97 | 33.64 34 55.37 | 29.55 34 56.03 | 29.73 35 3.50 | 27.88 35 21.07
34 48.022 35 43.93 | 34 37.911 34 58.50 | 34 37.378 35 27.70 | 35 32.~~722~~ 803 35 47.20 | 35 33.033 35 49.33 | 35 30.978 36 6.13

47.981 +41.53 | 37.873 +51.36 | 37.340 +51.60 | 32.~~684~~ 80 +~~606~~ 1.06 | 32.995 +0.79 | 30.940 +2.81
35 29.077 -.48 | 35 28.475 -.67 | 35 28.431 -.53 | 35 33.572 -.46 | 35 33.330 -.55 | 35 32.564 -1.16
-41.H09 | -50.6058 | -51.0907 | -0.884 0.872 | -0.331 | -1.620

-3.44 | -2.82 | -2.78 | -4.48 | -4.26 | -3.50
+ 41.50 35 25.59 | + 51.34 25.74 | + 51.68 25.63 | + 0.99 28.92 | + 0.76 28.94 | + 2.81 29.07
- .48 | - .67 | - .68 | - .44 | - .57 | - 1.20
- 3.44 -0.030 | - 2.82 +0.590 | - 2.78 +.630 | - 4.48 | - 4.26 | - 3.50
+ 37.58 | + 47.85 | + 48.22 | - 3.93 | - 4.07 | - 1.89
34 47.98 16 21.72 | 34 37.87 23.81 | 34 37.34 16 28.75 | 35 32.80 42 25.21 | 35 32.99 26.96 | 35 30.94 26.49
+10 19.85 | +10 17.66 | +10 15.68 | -16 7.76 | -16 7.86 | -16 4.80
35 25.56 + 9 | 35 25.72 +.9 | 35 25.56 +.9 | 35 28.87 +1.2 | 35 28.92 +1.1 | 35 29.05 +.9
28.970 -11.60 | 29.130 -13.50 | 28.970 -13.50 | -7.30 | -8.40 | -11.20
+67 26 30.87 | 26 28.87 | 26 31.83 | 26 11.35 | 26 11.82 | 26 11.39

-34.41 -55.91 | +20.94 -20.59 | -17.99 -50.32 | +36.80 -14.37 | +29.53 -16.30 | +9.91 -35.75
5 | 5 | 5 | 40 | 40 | 40
-2.43 | -2.18 | -2.17 | -3.01 | -2.78 | -2.13
2 7.5 2 17.8 | 1 36.0 1 56.8 | 1 52.1 2 7.4 | 0 23.2 0 50.2 | 0 25.3 0 48.9 | 0 32.0 0 55.0
14.5 24.1 | 39.9 60.6 | 58.1 13.3 | 39.9 5.5 | 40.8 4.7 | 54.6 17.9
22.0 41.9 | 75.9 117.4 | 110.2 20.7 | 63.1 115.7 | 66.1 113.6 | 86.6 132.9
7 11.00 7 20.95 | 6 37.95 ~~6~~ 7 ~~58.70~~ 3.70 | 6 55.10 7 10.35 | 40 31.55 40 57.85 | 40 33.05 40 56.80 | 40 43.30 41 6.45

1.53668n 1.74749n | 1.32098 1.31266n | 1.25503n 1.70174n | 1.56585 1.15746n | 1.47026 1.21219n | 0.99607 1.54593n
1.23066n 1.44147n | 1.11496 1.10764n | 0.94901n 1.39572n | 1.27543 0.86704n | 1.17984 0.92177n | 0.69005 1.23991n
-17.01 -27.64 | +13.03 -12.81 | -8.89 -24.87 | +18.85 -7.36 | +15.13 -8.35 | +4.90 -17.88
6 53.99 6 53.31 | 6 50.98 6 ~~45~~ 50 .89 | 6 46.21 6 55.48 4 | 40 50.40 40 50.49 | 40 48.18 40 48.45 | 40 48.20 40 49.07

+67° 15' 54.36" 54.70 55.04 | 15 ~~57.37~~ 57.37 57.41 16 ~~2.46~~ 57.46 | 16 2.14 2.50 16 52.87 | 41 57.95 57.90 57.86 | 42 0.17 0.03 41 59.90 | 42 0.15 59.71 41 59.28
-25 3 6 2 56 | 3 22 3 7 | 3 17 2 56 | 3 5 2 42
1.42990n 1.42990n | 1.43000n 1.42990n | 1.43000n 1.42980n | 1.42990n 1.42980n
+928 | -701 | -637 | +984 | +345 | -868
1.43918 1.43918 | 1.42289 1.42289 | 1.42363 1.42353 | 1.43984 1.43964 | 1.43345 1.43325 | 1.42122 1.42112
+27.49 +27.49 | +26.48 +26.48 | +26.52 +26.52 | +27.53 +27.52 | +27.13 +27.12 | +26.99 +26.99

-.23 -.47 -.62 | -.08 -.08 -.08 | -.06 -.27 -.49 | -.26 -.22 -.04 | -.16 -.18 -.05 | -.02 -.21 -.24
-.04 -.05 | .00 .00 | .00 .00 | -.05 -.09 | -.06 -.09 | -.06 -.10
+27.22 +26.82 | +26.40 +26.40 | +26.46 +26.03 | +27.22 +27.39 | +26.91 +26.98 | +26.91 +26.65
16 21.58 21.86 | 16 23.77 23.86 | 16 28.60 28.90 | 42 25.17 25.25 | 42 27.08 26.88 | 42 27.06 25.73
26 42.8 | 44.7 | 44.7 | 26 18.6 | 19.7 | 22.5
+10 21.2 20.9 | +10 20.7 20.8 | +10 16.1 15.8 | +16 6.6 6.6 | +16 7.4 7.2 | +16 4.6 3.4
+10 21.05 30.74 | 20.6 20.85 29.03 | 15.95 31.32 | -16 6.60 10.85 | 7.30 11.61 | 4.00 11.61
+10 21.4 31.02 | 21.2 29.12 | 16.3 31.62 | -16 6.2 10.93 | 6.9 11.41 | 3.6 10.98
+10 19.87 20.76 -31.51 | + 17.85 18.76 -33.41 | + 15.31 16.22 33.41 | -16 8.28 7.02 | - 8.23 7.07 | - 5.14 4.25
+ .89 26 30.88 | + .91 29.07 | + .91 31.47 | + 1.26 26 10.89 | + 1.16 11.51 | + .89 11.04
- 11.60 26 10.97 | - 13.50 ~~14.16~~ | - 13.50 11.56 | - 7.30 | - 8.40 | - 11.20
+10 9.16 | + 5.26 9.86 | + 2.72 | -16 14.32 | - 15.47 | - 15.45

B. A. C. 3978

h m sec.
11 37 8
+ 42° 25'
− 0° 3'
sin z = −.00

1874
α,
δ,
dα/dt
dδ/dt

l cos δ 9.86821
l c .10992
l c' 9.97813

l sin δ 9.82899

1875
α, 36 59.80
δ, + 3.197
dα/dt 24 57.13
dδ/dt − 19.97

l cos δ 9.86821
l c .12552
l c' 9.99373

corr α =
corr δ =

tang δ = +.91
I = 2.79 s
K = −.021 s

1874 April 30		1874 May 5		1874 May 24		1875 April 27		1875 May 3	
−.053		−.152		~~−.268~~ −272		−.182		−.234	
36 8.9	36 3.7	36 4.6	35 33.3	35 51.4	35 46.7	36 44.6	36 29.4	36 44.9	36 34.0
11.7	5.9	7.4	36.0	54.3	49.5	47.5	32.0	47.7	37.5
14.3	8.0	10.2	38.0	56.8	52.2	51.2	34.4	50.4	39.7
19.8		15.9		2.5		55.8		56.0	
22.8		18.7		5.3		58.6		58.8	
25.6		21.3		8.0		37 1.3		37 1.6	
28.4	36 48.1	24.3	36 41.9	11.0	36 34.1	4.2	37 19.4	4.5	37 19.3
31.3	51.4	27.0	44.3	13.6	36.5	7.0	22.3	7.3	23.0
36.8	53.6	32.7	47.0	19.2	38.4	12.5	25.0	12.8	24.9.
39.5		35.4		21.9		15.4		15.7	
42.4		38.1		24.8		18.2		18.5	
2815		2356		2688		3153		3182	
				180		300		300	
	36 5.87		35 55.83	888	35 49.47	153	36 31.93	182	36 37.07
36 25.591	36 51.03	36 21.418	36 44.40	36 8.073	36 36.33	37 1.391	37 22.23	37 1.655	37 22.40
25.570		21.397		8.052		1.370		1.634	
+ 33.09		+ 37.29		+ 50.53		+ 0.99		+ 0.76	
− .05		− .14		− .25		− .16		− .21	
− 1.97	+1.227	− 1.91	+1.287	− 1.62	+1.577	− 2.42		− 2.34	
+ 31.07		+ 35.24		+ 48.66		− 1.59		− 1.79	
36 25.57		36 21.40		36 8.05		37 1.34		37 1.63	
36 56.64	∂''	36 56.64		36 56.71		36 59.78		36 59.84	
59.837		59.837			59.907				
				56.693				59.810	
+19.72	−25.44	+25.59	−22.98	+18.60	−28.26	+29.46	−20.84	+24.58	−20.75
5		5		5		40		40	
−197		−206		−2.19		−301		−278	
2 25.1	3 8.7	2 15.1	3 2.3	2 17.9	2 3.6	1 6.1	1 55.0	1 9.0	1 54.0
29.6	13.0	26.1	12.9	26.3	10.9	20.3	9.3	21.6	6.9
547	217	412	152	442	145	264	1243	306	1209
7 27.35	8 10.85	7 20.60	8 7.60	7 22.10	7 (8) 7.25	41 13.20	42 2.15	41 15.30	42 0.45
1.29491	1.40552	1.40807	1.36135	1.26951	1.45117	1.46923	1.31890	1.39058	1.31702
1.27304	1.38365n	1.38620	1.33948n	1.24764	1.42931n	1.46296	1.31263n	1.38431	1.31075n
+18.75	−24.19	+24.33	−21.85	+17.69	−26.87	+29.04	−20.54	+24.03	−20.45
7 46.10	7 46.66	7 44.93	7 45.75	7 39.79	7 40.38	41 ~~44.16~~ 42.24	41 41.61	41 39.53	40.00
+42° 15 2.25	1.69	15 3.42	2.60	15 8.56	7.97	41 4.19	6.74	41 8.82	8.35
1.97		3.01		8.26		6.11 6.42		8.58	
−0 2 50	2 6	2 56	2 9	2 55	2 10	2 35	1 46	2 33	1 48
8.64600	8.54300n	8.68300n	8.54300n	8.68300n	8.56000n	8.63100n	8.46400n	8.63100n	8.46400n
+769		+551		−751		+990		+352	
8.65369	8.55069	8.68851	8.54851	8.67549	8.55249	8.64090	8.47390	8.63452	8.46752
+0.04	+0.03	+0.05	+0.03	+0.05	+0.03	+0.04	+0.03	+0.04	+0.03
−.10 −.19	−.17	−.17 −.21	−.14	−.09 −.37	−.21	−.23 −.33	−.11	−.16 −.29	−.11
−.05	−.06	−.05	−.06	−.19	−.25	−.12	−.20	−.12	−.20
−0.11	−0.20	−0.17	−0.17	−0.23	−0.43	−0.31	−0.28	−0.24	−0.28
+42 15 2.14	1.49	15 3.25	2.43	15 8.33	7.54	41 5.80	6.46	41 8.58	8.07
+10 18.53	18.53	+18.70	18.70	+16.01	16.01	−16 8.28	8.28	−8.23	8.23
	00 − 23.80		00 − 24.62		00 − 27.14	00		00	
−3.88	25 16.87	−4.~~34~~ 4.65	17.30	−7.17	17.17	−1.36	56.16	−2.38	57.97
+10 14.73	16.22	+ 14.05	16.48	+ 8.84	16.38	−16 9.64	56.82	−10.61	57.46
25 16.54		16.89		16.77		24 ~~56.34~~ 56.49		57.72	
56.57		56.92		56.80					

X Ursae Majoris
11h 39m 27sec
+48° 28'
ζ = −6° 5'
sin z = −11

1874

Apr.	30	39m 25.63s		28' 45.0"	
May	5	25.55	−.08	45.9	+.9
	10	25.47	.08	46.7	.8
	15	25.38	.09	47.4	.7
	20	25.29	.09	48.0	.6
	25	25.20	.09	48.5	.5
	30	25.10	.10	49.0	.5
June	4	25.00	.10	49.4	.4
	9	24.90	.10	49.7	.3

1874
α 23.396s
δ +28' 39.81"
dα/dt +3.197
dδ/dt −19.978

log cos δ 9.82155
log b .10992
log b' 9.93147

log sin δ 9.87423

cor α =
cor δ =

Log δ = +1.13 151
I = 3.11s
K = −0.23s

X 1874 | X | X | X | X | X
−07 Apr. 30 | −15 May 5 | −20 May 10 | −18 −08 May 19 | −28 May 24 | −28 May 26
−.053 | −.152 | −.199 | −.260 | ~~−.268~~ −.272 | −.280

11 38 34.0 38 36.1 | 38 · 38 53.0 | 38 25.5 38 14.3 | 38 — 38 54.2 | 38 16.4 38 3.3 | 38 15.6 38 2.1
37.0 38.7 | 42.2 | 28.6 17.3 | — 57.3 | 19.5 6.8 | 18.8 4.7
40.2 41.3 | 43.7 | 31.7 19.5 | — 59.7 | 22.6 9.0 | 21.7 7.0
46.5 | 45.4 | 37.9 | 31.2 | 28.9 | 27.9
49.6 | 46.9 | 41.3 | 34.3 | 32.0 | 31.0
52.8 | 48.5 | 44.3 | 37.4 | 35.0 | 34.2
55.8 39 34.2 | 50.0 39 8.0 | 47.4 39 1.1 | 40.5 39 26.1 | 38.2 38 38.5 | 37.3 38 56.5
59.0 37.0 | 51.6 10.6 | 50.4 4.4 | 43.7 30.1 | 41.2 41.5 | 40.4 59.5
5.0 40.9 | 53.3 13.7 | 56.7 7.7 | — 33.2 | 47.4 43.7 | 46.5 2.1
8.2 | 54.8 | 59.8 | — | 50.6 | 49.7
11.3 | | 2.9 | — | 53.6 | 52.9

399~~2~~4 | 4364 | 4265 | 1871 | 3854 | 3760
180 | | 60
579~~2~~4 38 38.70 | 38 53.00 | 4865 38 17.03 | 38 57.07 | 38 6.37 | 38 4.60
38 52.655 39 37.37 | 38 48.489 39 10.77 | 38 ~~54.056~~ 44.227 39 4.40 | 38 37.420 39 29.80 | 38 35.036 38 41.23 | 38 34.182 38 39.37
673 +33.05 | +37.29 | +41.53 | +48.17 | +30.56 | +51.36
52.650 −08 | 48466 −17 | 44204 −23 | 37.397 −20 | 35.013 −32 | 34.159 −32
39 25.63 | 39 25.55 | 39 25.47 | 39 25.3×0 −.12 | 39 25.2×1 | 39 25.18
−32.98 −2.23 | −37.08 −2.15 | −41.27 −2.07 | −47.9×0 −1.90 | −50.2×0 −1.81 | −51.02 −1.78
39 23.39 | 23.44 | 23.43 | 23.35 | 23.44 | 23.42

+ 33.09 | + 37.29 | + 41.50 | + 48.09 | + 50.53 | + 51.334
− .06 | − .17 | − .22 | − .30 | − .31 | − .32
− 2.23 +0.967 | − 2.15 +1.047 | − 2.07 +1.127 | − 1.90 +1.297 | − 1.81 +1.3 87 | − 1.78 +1.417
+ 30.80 18 26.46 | + 34.97 27.27 | + 39.21 26.70 | + 45.89 32.79 | + 48.41 31.96 | + 49.24 30.85
38 52.65 +10 19.05 | 38 48.47 +10 19.15 | 38 44.20 +10 19.85 | 38 37.40 +10 16.17 | 38 35.01 +10 16.26 | 38 34.16 +10 17.66
+.3 | +.2 | +.3 | +.2 | +.3 | +.2
39 23.45 −5.20 | 39 23.484 −6.10 | 39 23.41 −6.90 | 39 23.29 −8.10 | 39 23.42 −8.60 | 39 23.40 −8.80
26.647 48 28 40.61 | 26.657 31 28 40.52 | 26.607 28 39.95 | 26.487 28 41.06 | 26.617 28 39.92 | 26.597 28 39.91

13.97 44.70 | | 7 28.20 20.17 | 9 | |
+ ~~13.45~~ − ~~44.72~~ | −4.51 −22.28 | + ~~37.03~~ −10.34 | −1765 −52.38 | +28.67 −6.19 | +29.58 −25.19
0 | 0 | 0 | 0 | 0 | 0
1 −1.97 | −2.06 | −2.13 | −2.20 | −2.19 | −2.18
4 16.1 0 5.1 | 4 27.2 4 43.3 | 3 1.1 4 41.4 | 4 36.6 0 2.6 | 3 34.8 4 24.2 | 3 55.7 4 41.4
15.5 7.0 | 33.7 50.1 | 8.1 48.2 | 39.2 8.9 | 0.2 30.3 | 61.9 46.9
31.6 12.1 | 60.9 93.4 | 9.2 89.6 | 75.8 11.5 | 115.0 54.5 | 117.6 88.3
4 15.80 5 6.05 | 4 30.45 4 46.70 | 3 4 4.60 4 44.80 | 4 37.90 5 5.75 | 3 57.50 4 27.25 | 3 58.80 4 44.15

1.14457 1.65050n | 1.65418n 1.34792n | ~~1.45025~~ 1.43457 1.30471n | ~~1.24674n~~ 1.29336 1.71917n | 1.45743 0.79169n | 1.47100 1.40123n
1.07664 1.58197n | 0.58565n 1.27939n | ~~1.38172~~ 1.36604 1.33618n | ~~1.17821n~~ 1.22483 1.65064n | 1.38890 0.72316n | 1.40247 1.33270
+11.94 −38.19 | −3.85 −19.03 | ~~+24.10~~ ~~+23.33~~ −17.23 | −15.07 −44.73 | +24.49 −5.29 | +25.26 −21.57
4 27.74 4 27.86 | 4 26.60 4 27.67 | 4 ~~28.67~~ 27.83 4 27.57 | 4 ~~22.83~~ 16.78 21.12 4 21.02 | 4 21.99 4 21.96 | 4 24.06 4 22.64

+48° 18 20.61 20.44 | 18 21.75 20.68 | 18 ~~19.66~~ 20.52 20.78 | 18 ~~25.59~~ 27.23 27.33 | 18 26.36 26.39 | 18 24.29 25.71
20.54 | 21.22 | 20.65 | 27.28 | 26.37 | 25.00
−6 6.1 5 11
0.78920n 0.78820n
+774 | +556 | +937 | −200 | −738 | −685
.79694 .79594 | .79476 .79376 | .79857 .79757 | .78720 .78620 | .78182 .78082 | .78235 .78135
+6.26 +6.25 | +6.23 +6.22 | +6.29 +6.27 | +6.13 +6.11 | +6.05 +6.04 | +6.06 +6.04

−.05 −.33 −.53 | −.1 −.16 −.13 | −.20 −.18 −.11 | −.10 −.60 −.73 | −.22 −.45 −.02 | −.23 −.20 −.17
−.09 .00 | −.09 −.10 | −.06 −.09 | −.37 −.01 | −.31 −.36 | .00 .00
+6.12 +5.72 | +6.13 +5.99 | +6.03 +6.07 | +5.66 +5.37 | +5.52 +5.66 | +5.83 +5.87
18 26.73 26.19 | 18 27.88 26.67 | 18 26.55 26.85 | 18 32.89 32.70 | 18 31.88 32.05 | 18 30.12 31.58
28 45.0 | 45.9 | 46.7 | 47.9 | 48.4 | 28 48.6
+10 18.3 18.8 | 18.0 19.2 | 20.2 19.9 | 15.0 15.2 | 16.5 16.4 | +10 18.5 17.0
+10 18.6 28 40.27 | 18.6 40.70 | 20.1 39.75 | 15.1 41.10 | 16.5 39.53 | 17.7 39.41
+10 18.53 18.74 39.73 | + 18.70 18.92 39.41 | + 19.87 20.10 40.05 | + 16.07 16.31 40.91 | + 16.01 16.25 39.70 | + 17.85 18.09 40.87
+ .21 −26.18 | + .22 −26.08 | + .23 −26.88 | + .24 28.08 | + .24 −28.08 | + .24 −28.78
− 5.20 28 40.00 | − 6.10 40.10 | − 6.90 39.87 | − 8.10 41.01 | − 8.60 39.61 | − 8.80 40.15
+10 13.54 28 20.02 | + 12.82 20.12 | + 13.20 19.89 | + 8.21 21.03 | + 7.65 19.63 | + 9.29 20.17

1875 s
α 26.592
δ +28 19.83
dα/dt +3.196
dδ/dt −19.978

l cos δ 9.82155
l b .12552
l b' 9.94707

1875	m	s		°	″	
Apr. 30	39	29.26		28	23.0	
May 5		29.18	−.08		23.9	+.9
10		29.09	.09		24.7	.8
15		29.00	.09		25.4	.7
20		28.91	.09		26.1	.7
25		28.82	.09		26.6	.5
30		28.72	.10		27.1	.5

1874.0 α	δ	1875.0 α	δ
23.45		26.55	
46		47	
41		64	
29		56	
42		52	
40			
44			
23.410		26.548	
.396	39.81	.592	19.83
+.014		−.044	

X 1874 −22 May 27		1875 −19 April 27		−23 May 3		−49 May 23		−55 May 26		−52 May 27	
−2.83		−1.82		−2.37		−.500		−.552		−.510	
38 15.3 18.3 21.4 27.5 30.7 33.8 37.0 40.2 46.2 49.5 52.6	37 56.2 58.8 1.1 38 48.3 51.3 54.3	39 9.8 12.8 16.2 22.2 25.1 28.4 31.6 34.8 41.1 44.2 47.2	38 54.8 57.9 0.3 39 38.5 42.5 44.7	39 — — — 22.3 25.5 28.5 31.8 35.0 — — —	39 36.9 40.5 42.8	39 8.0 11.2 14.2 20.4 23.4 26.6 29.8 33.0 39.2 42.3 45.4	39 1.8 4.5 6.3 39 41.2 43.7 46.1	39 7.6 10.6 13.7 19.9 23.2 26.1 29.2 32.4 38.7 41.8 44.9	39 6.2 8.7 11.0 40 2.4 5.0 7.4	39 7.4 10.6 13.8 19.8 22.9 26.0 29.0 32.2 38.4 41.6 44.6	39 6.7 9.0 12.0 39 49.4 51.5 54.1
37.25 38 33.864	37 58.70 38 51.30	31.34 39 28.491	38 57.67 39 41.90	14.31 39 28.620	39 40.07	29.35 39 26.682	39 4.20 39 43.67	28.81 39 26.191	39 8.63 40 4.93	28.63 39 26.027	39 9.23 39 51.67
33.841 39 25.16 − 51.32	+57.61 −25	28.468 39 29.340 −0.84	+1.06 −21	28.597 39 29.21 −0.61	+0.79 −26	26.659 39 28.885 −220.19	+2.81 −55	26.168 39 28.80 −2.63	+3.24 −.62	26.084 39 28.78 −2.78	+3.33 −.59
	−1.76		−2.71		−2.62		−2.26		−2.21		−2.19
+ 51.678 39 − .32 − 1.76 +1.437 + 49.60	23.44	+ 0.99 − .20 − 2.71 − 1.92	26.61	+ 0.76 − .27 − 2.62 − 2.13	26.51	+ 2.81 − .57 − 2.26 − 0.02	26.66	+ 3.22 − .62 − 2.21 + 0.39	26.58	+ 3.29 − .58 − 2.19 + 0.52	26.55
38 33.84 39 23.44 26.637 +48	18 33.21 +10 15.68 +.3 −890 28 40.29	39 28.47 39 26.55	44 30.68 −16 7.76 +.3 −2.70 28 20.52	39 28.60 39 26.47	32.55 −16 7.86 +.2 −380 28 21.09 ~~22.86~~	39 26.66 39 26.64	31.57 −16 4.80 +.2 −660 28 20.37	39 26.17 39 26.56	30.67 −16 3.36 +.2 −690 28 20.62	39 26.00 39 26.52	31.34 −16 3.59 +.2 −700 28 20.95
+35.16 0 −2.17	−17.44	+30.82 35 −3.01	−13.41	−11.45 35 −2.78		+22.48 35 −2.13	−16.99	+17.56 35 −2.09	−38.74	+16.80 35 −2.07	5 −2.64
3 46.6 54.1 100.7 36 50.35	4 32.1 40.9 73.0 4 36.50	2 49.5 3.6 113.1 37 56.55	3 27.1 42.9 70.0 38 35.00	3 25.0 38.5 63.5 38 31.75		2 51.1 12.8 123.9 38 1.95	3 27.1 48.9 76.0 38 38.00	2 55.5 20.2 135.7 38 7.85	3 44.0 10.1 114.1 38 57.05	2 55.5 19.9 135.4 38 7.70	3 32.9 57.6 90.5 38 45.25
1.54605 1.47752 +30.23 4 20.38	1.24155n 1.17802n −14.90 4 21.60	1.48883 1.43590 +27.28 38 23.83	1.12743n 1.07450n −11.87 38 23.13	1.05881n 1.00588n −10.13 38 21.62		1.35180 1.29887 +19.90 38 21.85	1.23019n 1.17726n −15.04 39 22.96	1.24452 1.19159 +15.54 38 23.39	1.58816n 1.53523n −34.29 38 22.46	1.22531 1.17238 +14.87 38 22.07	~~40892~~ 1.~~25488~~n 1.3~~0195~~n 35.557 ~~22.40~~ 38 ~~20.21~~ 22.55
18 27.97 27.36 6 27 0.78970n −623 .78347 +6.07	26.75 5 41 0.78880n .78257 +6.06	44 24.52 24.87 5 52 0.78910n +999 .79909 +6.30	25.22 5 13 0.78820n .79819 +6.28	44 26.73 +361 .79271 +6.20	.79181 +6.19	44 26.50 25.94 −852 .78058 +6.03	25.39 .77968 +6.02	44 24.96 25.27 −1402 .77508 +5.96	25.59 .77418 +5.95	44 25.78 25.79 5 40 0.78880n −1128 .77752 +5.99	~~23.14~~ 25.80 5 3 0.78810n .77682 +5.98
−.33 .00 +5.74 18 33.71 48.7 +10 15.0 +10 15.5 +10 15.31 + .23 − 8.90 +10 6.64	−.21 −.09 .00 +5.97 32.75 16.0 40.35 15.64 39.36 28.88 28 39.85 28 19.87	−2.5 −.29 +5.76 44 30.28 28 22.5 +16 7.6 −16 8.2 −16 8.28 + .33 − 2.70 −16 10.65	−.47 −.05 −.36 +5.87 31.09 8.6 19.63 7.95 20.44 28 20.03	−.03 −.35 +5.82 44 32.55 23.6 +16 9.0 9.0 − 8.23 + .30 − 3.80 − 11.73	~~−.19~~ −.38 7.93 20.82	−.13 −.27 +5.63 44 32.13 26.4 +16 5.7 5.1 − 5.14 + .23 − 6.60 − 11.51	−.40 −.08 −.32 +5.62 31.01 4.6 20.62 4.91 19.50 20.06	−.09 −.28 +5.59 44 30.55 26.7 +16 3.9 4.0 − 3.47 + .22 − 6.90 − 10.15	−.56 −.40 −.35 +5.20 30.79 4.1 20.40 3.25 20.64 20.52	−.08 −.28 +5.63 44 31.41 26.8 +16 4.6 4.5 − 4.01 + .22 − 7.00 − 10.79	−.43 −.17 −.34 +5.47 31.27 4.5 20.62 3.79 20.48 20.55

7

β Leonis.
$11^h\ 42^m\ 41^s$ ᴀʀ.
+15° 16′

γ = + 27°. 7′
ζinz = +.45

1874

Apr. 30	42ᵐ	39.27ˢ		16′	30.7″
May 5		39.23	−.04		31.2 +.5
10		39.19	.04		31.6 .4
15		39.15	.04		32.1 .5
20		39.10	.05		32.5 .4
25		39.05	.05		32.9 .4
30		39.00	.05		33.3 .4
June 4		38.95	.05		33.7 .4
9		38.90	.05		34.0 .3

1874
α 37.877ˢ
δ +16.34.58
$\frac{d\alpha}{dt}$ +3.065
$\frac{d\delta}{dt}$ −20.097″

l cos δ 9.98440
l b .10992
l b′ .09432
l sin δ 9.42047

corr α =
corr δ =
tang δ = +.27 1.04
I = 2.13°
k = −.016°

	+ 1874 April 30 −.07		× May 5 −.15		× May 10 −.20		× May 19 −.18	−.08	× May 24 −.28		× May 26 −.28	
	−.053		−.152		−.199		−.265		~~−.268~~ −.272		−.280	
11	41 53.5	41 44.2	41 49.2	41 41.8	41 45.1	41 40.0	41 38.3	41 34.0	41 35.8	41 32.1	41 35.0	41 27.0
	55.6	46.7	51.4	43.6	47.2	42.3	40.4	36.4	37.9	34.3	37.1	29.0
	57.7	48.5	53.4	46.0	49.2	44.1	42.7	37.8	40.1	36.0	39.2	30.7
	1.9		57.7		53.4		46.9		44.3		43.5	
	4.0		59.8		55.6		48.9		46.5		45.7	
	6.2		2.0		57.8		57.0		48.6		47.8	
	8.3	42 31.0	4.1	42 22.6	59.8	42 7.4	53.3	42 16.7	50.8	42 24.7	50.0	42 3.6
	10.5	32.9	6.3	24.0	2.0	9.8	55.4	19.0	52.9	25.7	52.1	5.4
	14.7	34.7	10.6	25.8	6.2	12.0	59.6	21.0	57.1	26.6	56.3	7.1
	16.9		12.7		8.5		1.7		59.3		58.5	
	19.2		14.7		10.6		3.9		1.4		0.6	
	2485		3219		3954		4421		4747		4658	
	180		300		240		120		60		60	
	685	41 46.47	219	41 43.80	6354	41 42.13	5621	41 36.07	5347	41 34.13	5258	41 28.90
	42 6.227	42 32.87	42 1.991	42 24.13	41 57.764	42 9.73	41 51.100	42 18.10	41 48.609	42 25.67	41 47.800	42 5.37
	6.211	+33.05	1.975	+37.29	57.748	+41.53	51.084	+48.17	48.593	+50.56	47.784	+51.36
	42 39.27	−.02	42 39.23	−.04	42 39.19	−.05	42 39.11	−.05	42 39.06	−.08	42 39.04	−.08
	−33.06		−37.26		−41.44		−48.03	−.08	−50.47		−51.26	
		−139		−135		−131		−123		−118		−116
	+ 33.09	42 37.85	+ 37.29	~~37.87~~ 8	+ 41.51	37.92	+ 48.09	37.89	+ 50.53	37.89	+ 51.33 4	37.90
	− .01		− .04	.88	− .05		− .07		− .07		− .07	
	− 1.39	+1.675	− 1.35	+1.715	− 1.31	+1.755	− 1.23	+1.835	− 1.18	+1.885	− 1.16	+1.905
	+ 31.69		+ 33.90		+ 40.15		+ 46.79		+ 49.28		+ 49.11	
	42 6.21	6 12.69	42 1.97	13.31	41 57.75	12.13	41 51.08	18.11	41 ~~48.61~~	17.35	41 47.~~80~~	15.60
		+10 19.05		+10 19.15		+10 19.85		+10 16.17	59	+10 16.26	78	+10 17.66
	42 37.90	− 1.0	42 37.87	− 1.0	42 37.90	− 1.0	42 37.87	− 1.0	42 37.8~~8~~7	− .9	42 3~~7.91~~ 89	− .9
	40.965	+ 3.90	40.935	+ 3.40	40.965	+ 3.00	40.935	+ 2.20	40.935	+ 1.80	40.955	+ 1.60
	+15	16 34.64		16 34.86		16 33.98		16 35.48		16 34.51		16 3~~4~~3.96 33.96
15	+ 19.76	− 26.64	15 + 18.19	− 22.14	15 + 15.63	− 11.97	15 + 15.03	− 27.80	15 + 14.48	− 37.06	15 + 18.90	− 17.57
	− 1.97		− 2.06		− 2.13		− 2.20		− 2.19		− 2.18	
	0 36.3	1 34.5	0 34.6	1 24.9	0 37.9	1 13.9	0 36.3	1 29.9	0 37.7	1 41.7	0 32.9	1 19.0
	45.0	43.6	49.9	40.9	52.8	28.6	47.9	40.6	50.0	54.0	47.1	32.5
	81.3	78.1	84.3	65.8	90.7	42.5	84.2	70.5	87.7	95.7	80.0	51.5
	15 40.65	16 39.05	15 42.25	16 32.90	15 45.35	16 21.25	15 42.10	16 35.25	15 43.85	16 47.85	15 40.00	16 25.75
	1.29579	1.42553n	1.25983	1.34518n	1.19396	1.07809n	1.17696	1.44404n	1.16077	1.56891n	1.27646	1.24477n
	1.39011	1.51985n	1.35415	1.43950n	1.28828	1.17241n	1.27128	1.53836n	1.25509	1.66323n	1.37078	1.33909n
	+ 24.55	− 33.10	+ 22.60	− 27.51	+ 19.42	− 14.88	+ 18.67	− 34.54	+ 17.99	− 46.03	+ 23.48	− 21.83
	16 5.20	16 5.95	16 4.85	16 5.39	16 5.77	16 6.37	16 0.77	16 0.71	16 1.84	16 1.80	16 23.48	16 3.92
+15°	6′ 43.15″	42.40	6 43.50	42.96	6 42.58	41.98	6 47.58	47.64	6 46.51	46.55	6 44.87	44.43
	42.77		43.23		42.28		47.61		46.53		44.65	
+27	5 24	6 22										
	1.46900	1.46930										
	+779		+562		+944		−1.90		−7.26		−6.74	
	1.47679	1.47709	1.47462	1.47492	1.47844	1.47874	1.46710	1.46740	1.46174	1.46204	1.46226	1.46256
	−29.98	−30.00	−29.83	−29.85	−30.09	−30.11	−29.32	−29.34	−28.96	−28.98	−28.99	−29.01
	−.05 −.09	−.10	−.05 −.08	−.07	−.03 −.05	−.02	−.03 −.16	−.11	−.03 −.21	−.19	−.05 −.04	−.04
	−.01	−.03	−.01	−.03	−.02	−.03	−.06	−.13	−.06	−.14	.00	.00
	−30.04	−30.13	−29.89	−29.95	−30.14	−30.16	−29.41	−29.58	−29.05	−29.31	−29.04	−29.05
6	13.11	12.27	6 13.61	13.01	6 12.44	11.82	6 18.17	18.06	6 17.46	17.24	6 15.83	15.38
16	30.7		31.2		31.6		32.0 4		32.8		33.0	
+10	17.6	18.4	17.6	18.2	19.2	19.8	14.2	14.3	15.3	15.6	17.2	17.6
+10	18.0	34.66	17.9	34.79	19.5	34.36	14.3	35.45	15.4	34.29	17.4	34.30
+10	18.53 17.65	33.82	+ 18.70 17.78	34.19	+ 19.87 18.92	33.74	+ 16.07 15.08	35.34	+ 16.01 15.03	34.07	+ 17.85 16.87	33.85
−	.88 −16.20		− .92 −16.70		− .95 −17.10		− .99 −17.90		− .98 −18.30		− .98 18.50	
+	3.90	16 34.24	+ 3.40	34.49	+ 3.00	34.05	+ 2.20	35.40	+ 1.80	34.18	+ 1.60	34.07
+10	21.55	16 14.14	+ 21.18	14.39	+ 21.92	~~14.45~~ 13.95	+ 17.28	15.30	+ 16.83	14.08	+ 18.47	13.97

1875

Apr. 30	42	42.67		15	68.6	
May 5		42.63	-.04		69.1	+5
10		42.59	.04		69.5	.4
15		42.55	.04		70.0	.5
20		42.51	.04		70.4	.4
25		42.46	.05		70.8	.4
30		42.41	.05		71.2	.4
June 4		42.36	.05		71.6	.4
9		42.31	.05		71.9	.3

1875
α 40.942
δ +16 14.48
+ 3.065
- 20.097

δ cos δ 9.98440
.12552
.10992

1874.0 α	δ	1875.0 α	δ
37.90		40.86	
87		.93	
90		96	
87		94	
89		91	
91			
92			
37.894		40.920	
.877	34.58	.942	14.48
+.017		-.022	

X 1874 -.22 May 27 -.263 — 1875 -.19 April 27 -.182 — -.23 May 3 -.237 — -.37 -.20 May 5 -.518 — -.32 May 13 -.310 — -.32 May 17 -.340

11 41 34.7 41 23.0 42 29.0 42 21.0 42 29.2 42 20.7 42 29.6 42 19.8 42 28.3 42 22.2 42 27.9 42 26.2
36.9 25.1 31.0 23.1 31.3 22.6 31.7 21.8 30.4 24.3 30.2 28.3
38.9 27.2 33.1 24.5 33.4 25.1 33.8 23.9 32.6 25.9 32.2 30.6
43.1 34.5 34.9 38.0 36.8 36.4
45.3 39.5 39.8 40.2 39.0 38.5
47.5 41.6 44.9 42.4 41.1 40.7
49.6 42 15.0 43.8 42 55.0 44.0 42 58.9 44.5 42 56.9 43.2 43 4.9 42.8 42 58.8
51.8 16.9 45.9 56.5 46.3 0.9 46.6 58.8 45.4 7.0 45.0 0.6
56.1 18.8 50.2 58.4 50.4 3.0 50.9 0.7 49.5 8.3 49.2 2.5
58.1 52.5 52.7 53.1 51.8 51.3
0.3 54.5 54.8 55.2 53.8 53.4

4623 4586 4615 4660 4519 4476
60

52 23 41 25.10 42 22.87 42 22.80 42 21.83 42 24.13 42 28.37
41 47.482 42 16.90 42 41.691 42 56.63 42 41.955 43 0.93 42 42.364 42 58.80 42 41.082 43 6.73 42 40.691 43 0.63
47.466 +51.61 41.675 +0.06 41.939 +6.79 42.348 +0.63 41.066 +1.60 40.675 +1.93
42 39.03 -.06 42 42.659 -.05 42 42.65 -.06 42 42.63 -.10 42 42.57 -.09 42 42.53 -.09
-51.56 -~~0.98~~ 1.02 -0.71 -0.28 -.21 -1.50 -1.86
-1.15 -1.75 -1.71 -1.69 -1.63 -1.59
+ 51.648 42 37.87 + 0.99 40.934 .94 + 0.76 40.986 .96 + 0.44 4098 + 1.58 4095 + 1.92 4093
- .08 - .65 - .06 - .14 - .08 - .09
- 1.15 +1.915 - 1.75 - 1.71 - 1.69 - 1.63 - 1.59
+ 50.45 - 0.81 - 1.01 - 1.39 - 0.13 + 0.24
41 47.47 6 17.86 42 41.67 32 17.76 42 41.94 18.90 42 42.35 17.52 42 41.07 16.99 42 40.67 18.39
+10 15.68 -16 7.76 -16 7.86 -16 7.09 -16 5.46 -16 6.47
42 37.92 -.9 42 40.86 -1.3 42 40.93 -1.2 42 40.96 -1.2 42 40.94 -1.2 42 40.91 -1.1
40.985 +150 +620 +560 +540 +470 +430
+15 16 34.14 16 14.90 16 15.44 16 14.63 16 15.03 16 15.12

+22.38 -29.42 +18.82 -14.94 +19.15 -18.98 +20.53 -15.44 (6) +16.95 -25.65 +12.32 -19.94
15 45 45 45 45 45
1 -2.17 -3.01 -2.78 -2.70 ~~-2.38~~ -2.38 -2.26
0 25.7 1 30.4 4 30.6 0 14.0 4 30.3 0 19.0 4 30.0 0 18.2 4 33.9 0 27.9 4 37.8 0 19.7
41.5 45.3 41.9 24.1 40.2 27.8 38.5 26.8 45.7 41.2 50.0 31.8
67.2 75.7 72.5 38.1 70.5 46.8 85 45.0 79.6 69.1 87.8 51.5
1.58 33.60 16 37.85 49 36.25 50 19.05 49 35.25 50 23.40 49 34.25 50 22.50 49 39.80 50 34.55 49 43.90 50 25.75
18

1.34986 1.46864n 1.27462 1.17435n 1.28247 1.27830n 1.31239 1.~~18865~~ 21590 n 1.22917 1.40909n 1.09061 1.29973n
1.44418 1.56296n 1.38454 1.28427n 1.39369 1.38822n 1.42031 1.~~02855~~ 82552 n 1.33909 1.51901n 1.20053 1.40965n
+27.81 -36.55 +24.24 -19.24 +24.67 -24.45 +26.44 ~~-19.89~~ 21.17 +21.82 -33.04 +15.87 -25.68
16 1.41 16 1.30 50 0.49 49 57.81 49 59.52 49 58.90 50 0.69 50 ~~2.01~~ 1.33 50 1.62 50 1.57 49 59.77 50 1.07

6 46.94 47.05 32 47.86 48.54 32 48.43 49.40 32 47.66 45.74 32 46.73 46.84 32 48.58 48.28
46.99 48.20 48.91 47.34 47.02 46.78 48.43
5 17 6 21 5 48 6 31 5 56 6 38
1.46900 1.46930 1.46910 1.46940 1.46920 1.46940
-612 +1010 +372 +97 +41 +459
1.46288 1.46318 1.47920 1.47950 1.47282 1.47312 1.47007 1.47038 1.46951 1.46981 1.47379 1.47399
-29.03 -29.05 -30.14 -30.17 -29.71 -29.72 -29.51 -29.54 -29.48 -29.50 -29.77 -29.78

-.07 -.09 -.12 -.05 -.28 -.03 -.05 -.30 -.05 -.05 -.29 -.03 -.04 -.30 -.09 -.02 -.26 -.05
.00 .00 -.46 -.03 -.46 -.04 -.46 -.04 -.47 (2) -.05 -.42 -.04
-29.10 -29.17 -30.65 -30.23 -30.22 -29.81 -30.02 -29.61 -29.94 -29.64 -30.21 -29.87
6 17.84 17.88 32 17.21 18.31 32 18.21 19.59 32 17.64 17.41 32 16.79 17.20 32 18.37 18.41
33.1 16 8.x 8.9 9.1 9.8 10.2
+10 15.3 15.2 +16 8.5 10.0 +16 9.3 10.7 +16 8.5 +16 8.3 +16 7.0 +16 7.4 +16 8.2 +16 8.2
+10 15.3 -16 9.5 10.0 8.4 7.2 8.2
+10 15.31 14.34 33.68 -16 8.28 9.63 13.78 - 8.23 9.48 14.33 - 7.46 8.67 14.37 - 5.90 6.97 14.52 - 6.87 7.88 14.07 1479
- .97 -18.60 33.72 - 1.35 14.88 - 1.25 15.71 - 1.21 14.14 - 1.07 14.93 - 1.01 ~~14.11~~ 1483
+ 1.50 + 6.20 + 5.60 + 5.40 + 4.70 + 4.30
+10 15.84 16 33.70 -16 3.43 16 14.33 - 3.88 15.02 - 3.27 14.25 - 2.27 14.72 - 3.58 ~~14.07~~ 1481
16 13.60

73

β Virginis. corr. corr.
11h 44m 11s app.
+2° 28'
7 = +39° 55'
ℓ sin z = +.64

Long. = +.04 1.00
I = 2.07s
K = -.015s

1874						
Apr.	30	44m 9.13s		28' 21.0"	
May	5	9.10	-.03	21.2	+.2
	10	9.06	.04	21.4	.2
	15	9.02	.04	21.6	.2
	20	8.98	.04	21.9	.3
	25	8.94	.04	22.2	.3
	30	8.90	.04	22.5	.3
June	4	8.86	.04	22.8	.3
	9	8.81	.05	23.1	.3

1874	1875
α 7.858s	10.982
δ +28 28.34"	+28 8.06
+3.125s	+3.125s
-20.275"	-20.275
ℓ cos δ 9.99960	9.99960
ℓ b .10992	.12552
ℓ b' .10952	.12512
ℓ sin δ 8.63385	

× 1874 -.15 May 5 -.132 | × -.20 May 10 -.199 | × -.18 -.08 May 19 -.265 | × -.28 May 26 ~~-.286~~ -280 | × 1874 -.22 May 27 -.283 | 1875 -.23 May 3 -.237

48 19.4 43 19.0 43 15.3 43 1.6 43 8.6 43 25.8 43 5.3 43 4.7 43 — 43 26.9 43 5.9 43 49.4
21.6 20.7 17.3 3.0 10.7 27.6 7.4 6.8 — 28.8 44 1.5 51.6
23.6 22.2 19.4 3.0 12.8 29.7 9.5 8.8 — 30.5 3.7 53.6
27.8 23.4 16.8 13.4 13.2 7.7
29.9 25.5 19.0 15.6 15.3 9.7
31.9 27.6 21.1 17.7 17.3 11.8
34.0 43 59.2 29.6 43 40.7 23.1 43 57.5 19.7 43 49.0 19.4 14.0 44 29.2
36.1 1.1 31.8 42.7 25.2 39.6 21.8 50.9 21.5 16.0 31.4
40.2 3.0 35.9 44.8 29.2 1.3 25.9 52.7 — 20.1 33.7
42.4 38.0 31.3 27.9 — 22.2
44.4 40.0 38.3 30.0 — 24.3

3513 43 20.63 | 3038 43 32.0 | 2311 43 27.70 | 1942 43 6.77 | 867 43 28.73 | 19.05 43 51.47
43 31.936 44 1.10 | 43 27.618 43 42.73 | 43 .21009 43 59.47 | 43 17.655 43 50.87 | 43 17.340 | 60 44 31.43
1305
44 11.864

31.921 +37.29 | 27.603 +41.53 | 20994 +48.17 | 17.640 +51.36 | 17.325 +51.61 | 11.849 +0.79
44 9.10 -.01 | 44 9.06 -.01 | 44 8.99 -.01 | 44 8.93 -.01 | 44 8.92 -.01 | 44 12.55 -.01
-37.18 | -41.46 | -48.00 -.08 | -51.29 | -58.60 | -0.70

-1.24 | -1.20 | -1.13 | -1.07 | -1.06 | -1.57
+ 37.29 44 7.96 | + 41.51 7.92 | + 48.09 7.94 | + 51.334 7.92 | + 51.678 7.8 b .86 | + 0.76 11.06
- .01 | - .01 | - .01 | - .01 | - .01 | - .01
- 1.24 +1.885 | - 1.20 +1.925 | - 1.13 +1.995 | - 1.07 +2.055 | - 1.06 +2.065 | - 1.57
+ 36.04 | + 40.30 | + 46.95 | + 50.26 | + 50.61 | - 0.82
43 31.92 18 5.55 | 43 27.60 5.32 | 43 20.99 4.92 | 43 17.64 7.35 | 43 17.32 18 8.77 | 44 11.85 44 9.59
+10 19.15 | +10 19.85 | +10 16.17 | +10 17.66 | +10 15.68 | -16 7.86
44 7.96 -1.4 | 44 7.90 -1.4 | 44 7.94 -1.3 | 44 7.90 -1.3 | 44 7.93 -1.3 | 44 11.03 -1.7
11.085 +7.10 | 11.025 +6.90 | 11.065 +6.40 | 11.025 +6.00 | 11.055 +6.00 | +7.30
+2 28 30.40 | 28 ~~25.17~~ 30.67 | 28 26.19 | 28 29.71 | 28 29.15 | 28 9.33

0 +11.31 -29.16 | 0 +24.42 -15.11 | 0 -4.17 -35.94 | 0 +10.88 -33.22 | 0 -11.39 | 35 +20.39 -19.57
-2.06 | -2.13 | -2.20 | -2.18 -1 | -1.92 | -2.78

3 32.9 4 23.9 | 3 16.9 4 6.0 | 3 56.1 4 37.0 | 3 34.9 4 29.1 | 3 0.5 | 2 18.8 3 12.4
46.1 38.9 | 29.8 18.4 | 5.1 45.7 | 46.2 41.7 | 13.1 | 28.8 21.9
79.0 62.8 | 46.7 24.4 | 121.2 82.7 | 81.1 70.8 | 13.6 | 47.6 34.3
3 39.50 4 31.40 | 3 23.35 4 12.20 | 4 0.60 4 41.35 | 3 40.55 4 35.40 | 3 6.80 | 37 23.80 38 17.15

1.05346 1.46479n | 1.38775 1.17926n | 0.62014n 1.55558n | 1.03663 1.52140n | 1.05652n | 1.30942 1.29159n
1.16298 1.57431n | 1.49727 1.28878n | 0.72966n 1.66510n | 1.14615 1.63092n | 1.16604n | 1.43454 1.41671n
+14.55 -37.53 | +31.42 -19.44 | -5.37 -46.25 | +14.00 -42.75 | -14.66 | +27.20 -26.10
3 54.05 3 53.87 | 3 54.77 3 52.76 | 3 55.23 3 55.10 | 3 54.55 3 52.65 | 3 52.14 | 37 51.00 37 51.05

+2° 18' 54.30" 54.48 | 18 53.58 55.59 | 18 53.12 53.25 | 18 53.80 55.70 | 18 56.21 | 44 57.35 57.30
54.39 | 54.58 | 53.18 | 54.75 | | 57.32
+39 53 22 54 14 | | | 53 23 54 18 | | 53 36 54 29
1.68210 1.68230 | | | 1.68210 1.68230 | | 1.68210 1.68240
+565 | +949 | -183 | -667 | -603 | +379
1.68775 1.68795 | 1.69159 1.69179 | 1.68027 1.68047 | 1.67543 1.67563 | 1.67607 1.67627 | 1.68589 1.68619
-48.72 -48.75 | -49.16 -49.18 | -47.89 -47.91 | -47.36 -47.38 | -47.43 -47.45 | -47.41 -47.45

-.01 -.10 -.04 | -.03 -.09 -.01 | - 0 -.36 -.02 | -.01 -.03 -.05 | -.01 ~~.00~~ .01 | -.02 -.30 -.02
-.07 -.09 | -.07 -.08 | -.32 -.38 | -.00 -.00 | .00 | -.24 -.33
-48.80 -48.88 | -49.26 -49.27 | -48.21 -48.31 | -47.37 -47.43 | -47.44 | -47.67 -47.80
18 5.50 5.60 | 18 4.32 6.32 | 18 4.91 4.94 | 18 6.93 8.27 | 18 8.77 | 44 9.68 9.50
28 21.2 | 21.4 | 21.9 | 22.3 | 22.3 | 27 58.8
+10 15.7 15.6 | +10 17.1 15.7 | 17.0 17.4 | 15.9 14.0 | 13.5 | +16 10.8 10.7
+10 15.6 | 16.1 | 17.0 | 15.0 | 13.5 | -16 10.8
+10 18.70 17.39 29.99 | + 19.87 18.51 29.73 | +16.07 14.67 25.98 | + 17.85 16.46 28.89 | + 15.31 14.09 | -16 8.23 10.00 8.98
- 1.31 -12.17 30.09 | - 1.36 -13.37 31.73 | - 1.40 -13.87 26.01 | - 1.39 -14.27 30.73 | - 1.22 14.27 | - 1.77 8.80
+ 7.10 | + 6.90 | + 6.40 | + 6.00 | + 6.00 | + 9.30
+10 24.49 28 30.04 | + 25.41 30.73 | + 21.07 26.00 | + 22.46 29.81 | + 20.09 28.86 | -16 0.70 28 8.89
28 9.44 | 10.46 | 5.73 | 9.54 | 8.59

1875

Apr. 30	44m	12.57s		27	58.7"	
May 5		12.54	-.03		58.9	+.2
10		12.50	.04		59.1	.2
15		12.47	.03		59.3	.2
20		12.43	.04		59.6	.3
25		12.39	.04		59.9	.3
30		12.35	.04		60.2	.3
June 4		12.30	.05		60.5	.3
9		12.25	.05		60.8	.3

1875

-37 -20		-32		-32		-43		-49		-55	
May 5		May 13		May 17		May 22		May 23		May 26	
-.513		-.310		-.340		-.425		-.500		-.552	
43 59.8	43 51.6	43 58.6	43 53.4	43 58.2	43 51.7	43 57.7	43 51.1	43 57.3	43 50.7	43 56.6	43 55.3
44 1.9	53.0	44 0.6	55.1	0.2	53.6	59.9	52.5	59.4	52.2	59.0	58.0
4.0	54.7	2.8	57.0	2.3	55.2	44 1.9	54.0	44 1.3	54.3	44 1.0	
8.1		6.4		6.5		5.9		5.5		5.1	
11.2		8.9		8.5		8.0		7.6		7.2	
12.2		11.1		10.6		10.1		9.7		9.2	
14.3	44 23.7	13.1	44 29.1	12.7	44 27.2	12.1	44 21.5	11.8	44 30.1	11.3	44 24.0
16.3	25.5	15.1	30.9	14.7	29.3	14.3	23.6	13.8	32.1	13.3	25.5
20.5	26.9	19.2	33.0	18.9	31.0	18.3	25.1	17.9	33.9	17.4	27.3
22.4		21.3		20.9		20.4		20.0		19.5	
24.6		23.4		23.0		22.4		22.0		21.5	
						2310					
1943		1809		1765		~~2301~~		2263		2211	
60		60		60		120		120		120	5665
1343	43 53.10	1209	43 55.17	1165	43 53.50	1110	43 52.53	1063	43 52.40	1011	43 54.43
44 12.209	44 25.37	44 10.991	44 31.00	44 10.591	44 29.17	44 ~~10.009~~	44 23.40	44 9.664	44 32.03	44 9.191	44 25.60
	+0.63		+1.60		+1.93	44 10.091	+2.46		+2.81		+3.24
12.194	-.01	10.976	-.01	10.576	-.01	10.076	-.02	9.649	-.02	9.176	-.02
44 12.54	-.20	44 12.48		44 12.45		44 12.41		44 12.41		44 12.40 38	
-0.35	-1.56	-1.50	-1.50	-1.87	-1.47	-2.33	-1.43	-2.76	-1.43	-3.280	-1.40
44	11.05		11.07		11.03		11.09		11.01		11.00
+ 0.44		+ 1.58		+ 1.93	~~.04~~	+ 2.45		+ 2.81		+ 3.22	
- .02		- .01		- .01		- .02		- .02		- .02	
- 1.56		- 1.510		- 1.47		- 1.43		- 1.43		- 1.40	
- 1.14	44 8.18	+ 0.07	6.37	+ 0.45	7.47	+ 1.00	6.90	+ 1.36	6.21	+ 1.80	4.73
44 12.19	-16 7.09	44 10.98	-16 5.46	44 10.58	-16 6.47	44 10.88	-16 5.57	44 9.65	-16 4.80	44 9.18	-16 3.35
	-1.7		-.16		-1.5		-1.5		-1.5		-1.5
44 11.05	+9.20	44 11.05	+8.90	44 11.03	+8.70	44 11.08	+8.40	44 11.01	+8.30	44 10.88	+8.10
+2	28 8.59		28 8.21		28 8.20		28 8.23		28 8.21	9	28 7.98
5											
+19.11	-13.16	+15.82	-20.01	+17.09	-18.58	+17.56	-13.31	+17.26	-22.37	+12.54	-16.41
35		35		35		35		35		35	
1 -270		-238		-226		-217		-213		-208	
2 21.3	3 5.2	2 26.1	3 13.0	2 22.1	3 9.7	2 23.0	3 3.9	2 21.2	3 15.1	2 28.1	3 6.9
30.3	13.9	40.0	26.2	36.9	23.2	40.5	21.0	41.5	34.5	50.0	27.9
1 51.6	191	661	392	590	329	635	249	627	496	781	348
37 25.80	38 9.55	37 33.05	38 19.60	37 29.50	38 16.45	37 31.75	38 12.45	37 31.35	38 24.80	37 39.05	38 17.40
1.28126	1.11926	1.19921	1.30125	1.23274	1.26905	1.24452	1.12418 n	1.23704	1.34967 n	1.09830	1.21511 n
1.40638	1.24438	1.32433	1.42637 n	1.35486	1.39417 n	1.36964	1.24930 n	1.36216	1.47479 n	1.22342	1.34023 n
+35.49	-17.55	+21.10	-26.69	+32.79	-24.78	+23.42	-17.75	+23.02	-29.84	+16.73	-21.89
37 51.29	37 52.00	37 54.15	37 52.91	37 52.29	37 51.67	37 55.17	37 54.70	37 54.37	37 54.96	37 55.78	37 55.51
44 57.06	56.35	44 54.20	55.44	44 56.06	56.68	44 53.18	53.65	44 53.98	53.39	44 52.57	52.84
56.70		54.82		56.37		53.41		53.63		52.70	
										53 51	54 29
										1.68220	1.68240
+1.05		+47		+467		-1718		-834		-1376	
1.68315	1.68345	1.68257	1.68287	1.68678	1.68708	1.66492	1.66522	1.67376	1.67406	1.66844	1.66864
-48.21	-48.24	-48.15	-48.18	-48.61	-48.65	-46.23	-46.26	-47.18	-47.21	-47.69	-47.71
-.02 -.29	-.01	-.01 -.28	-.02	-.01 -.27	-.01	-.01 -.26	-.01	-.01 -.28	-.02	-.01 -.27	-.01
-.24	-.32	-.23	-.30	-.22	-.30	-.22	-.29	-.22	-.31	-.23	-.30
-48.47	-48.57	-48.39	-48.50	-48.84	-48.96	-46.46	-46.56	-47.41	-47.54	-47.93	-48.02
44 8.59	7.78	44 5.81	6.94	44 7.22	7.72	44 6.72	7.09	44 6.57	5.85	44 4.64	4.82
27 58.9		59.2		59.4		59.7		59.8		60.0	
+16 9.7	8.9	+16 6.6	7.8	+16 7.8	8.3	+16 7.0	7.4	+16 6.8	6.0	+16 4.6	4.8
-16 9.3	8.61	7.2	7.29	8.0	7.61	4.2	8.13	6.4	8.37	4.7	7.94
-16 7.46	9.18 7.86	- 5.90	7.42 8.42	- 6.87	8.31 8.11	- 5.61	6.99 8.50	- 5.14	6.50 7.65	-16 3.47	4.80 8.12
- 1.72		- 1.52		- 1.44		- 1.38		- 1.36		- 1.36	
+ 9.20	28 8.20	+ 8.90	7.85	+ 8.70	7.86	+ 8.40	8.32	+ 8.30	8.01	+ 8.10	8.03
35 59.98		- 58.52		- 54.61		- 58.51		- 58.20		- 56.70	

8

γ Ursae Majoris

11h 47m 13s

+54° 23'

γ = -12° 0'

sin z = -.21

1874

Apr. 30	47m 14s.30		23' 48".4	
May 5	14.21	-.09	49.4	+1.0
10	14.11	.10	50.3	.9
15	14.01	.10	51.1	.8
20	13.90	.11	51.8	.7
25	13.79	.11	52.4	.6
30	13.67	.12	52.9	.5
June 4	13.55	.12	53.2	.3
9	13.43	.12	53.5	.3

1874

α 11s.688

δ +23' 42".49

$\frac{d\alpha}{dt}$ +3s.188

$\frac{d\delta}{dt}$ -20".624

l cos δ 9.76579

l b .10992

l b' 9.87511

l sin δ 9.91005

cor α =

cor δ =

tang δ = +1.40 1.72

I = 3s.54

K = -.026

X 1874 April 30		X May 5		X May 10		+ May 19		+ May 24		+ May 26	
-.07		-.15		-.20		-.18 -.08		-.28		-.28	
-.053		-.152		-.199		-.265		~~-.265~~ -.272		-.280	
11 46 20.0	46 6.6	46	45 53.4	46 11.6	45 55.6	46 4.8	45 57.1	46 2.4	45 46.9	46 1.5	45 45.5
23.6	10.3	37.24 16.0	38.8	32.84 15.2	59.1	8.5	0.1	5.9	50.7	5.1	48.9
27.2	13.8	37.14 19.4	0.7	96 18.8	2.0	12.0	8.2	9.5	53.2	8.8	57.2
34.2		37.05 22.9		98 25.9		19.0		16.7		15.7	
37.7		36.88 29.8		84 29.3		22.5		20.1		19.2	
41.3		36.94 33.4		80 32.8		26.2		23.6		22.7	
45.0	47 12.2	37.20 37.2	46 46.8	86 36.5	46 46.7	29.8	46 39.6	27.2	46 47.9	26.3	46 44.6
48.6	16.2	37.16 40.7	49.8	72 39.8	50.0	33.4	43.5	30.8	51.1	29.8	47.5
55.6	20.4	37.12 44.2	52.8	—	53.0	40.5	48.5	37.8	54.7	36.9	49.8
59.1		—		—		44.0		41.3		40.6	
26		—		—		47.5		45.0		44.1	
		—									
391.9 60						288 2		260 3		250 7	
45 49	46 10.23		45 58.30		45 58.90		46 0.13		45 50.27		45 48.53
46 ~~41.08~~ 41.36 ~~41.56~~ 32	47 16.27 +33.05 -.10	46 37.091 37.065	46 49.80 +37.28 -.21	46 32.875 46 32.846	46 49.90 +41.53 -.28	46 26.200 26.174	46 43.87 +48.17 -.25 -.14	46 23.664 23.638	46 51.23 +50.56 -.39	46 22.791 22.765	46 47.30 +51.36 -.39
47 14.30		47 14.240		47 14.11		47 13.932		47 13.881		47 13.786	
-33.24	-2.61	-37.14	-2.51	-41.26	-2.42	-47.785	-2.23	-50.187	-2.12	-51.020	-2.07
	47 11.40 66		11.682 .62		11.68		11.72		11.69		11.66
+ 33.09		+ 34.29		+ 41.51		+ 48.10		+ 50.54		+ 51.34	
- .07		- .21		- .28		- .36		- .38		- .39	
- 2.61	+0.578	- 2.51	+0.678	- 2.42	+.768	- 2.23	+0.958	- 2.12	+1.068	- 2.07	+1.118
+ 30.41	13 3136	+ 34.57	3068	+ 38.81	2985	+ 45.51	3630	+ 48.64	3611	+ 48.88	3520
46 ~~41.06~~ 32	+10 1905 + 5	46 37.06	+10 1915 + .5	46 32.85	+10 1985 + .5	46 26.17	+10 1617 + .4	46 23.64	+10 1626 + .4	46 22.76	+10 1766 + .5
47 11.47	-600	47 11.63	-700	47 11.66	-780	47 11.68	-920	47 11.68	-980	47 11.64	-1000
~~14.658~~ 92	54 23 44.91	14.818	23 43.33	14.848	23 42.40	14.868	23 43.67	14.868	23 42.97	14.828	23 43.36
5 +30.85	-35.19	5 + 38.79	-12.71	5 + 33.97	-17.03	5 +26.07	-17.67	5 +33.39	-27.57	5 + 34.26	-24.51
-1.97		-2.06		-2.13		-2.20		-2.19		-2.18	
4 3.8	4 55.1	3 57.2	4 35.9	3 4? 2.0	4 40.1	3 2.1	4 45.1	3 56.5	4 41.9	3 55.8	4 41.4
6.3	55.7	4.0	42.9	9.0	47.1	6.0	49.4	1.7	46.0	2.1	46.0
121	110.8	121.2	78.8	11.0	87.2	8.1	84.5	118.2	87.9	117.9	87.4
9 6.05	9 55.40	9 0.60	9 39.40	8 9? 5.50	9 43.60	8 9 4.05	9 47.25	8 59.10	9 43.95	8 58.95	9 43.70
1.48926	1.54642n	1.58872	1.10415n	1.53110	1.23121n	1.41614	1.24724n	1.52862	1.44044n	1.53479	1.38934n
1.36437	1.42153n	1.46383	0.97926n	1.40621	1.11632n	1.29125	1.12235n	1.39873	1.31555n	1.40990	1.26445
+23.14	-26.40	+29.10	-9.53	+25.48	-13.07	+19.56	-13.26	+25.04	-20.68	+25.70	-18.38
9 29.19	9 29.00	9 29.70	9 29.87	8 9? 30.98	9 30.53	8 9 23.61	9 23.97	9 24.14	9 23.26	9 24.65	9 25.32
+54° 13' 19".16 19.25	19.35	13 18.65 18.56	18.48	14 (13?) 17.37 17.59	17.82	14 13 24.74 24.55	24.36	13 24.21 24.65	25.09	13 23.70 23.36	23.03
-12 1 11	0 22										
1.08850n	1.08800n										
+788		+571		+956		-1.72		-704		-655	
1.09638	1.09588	1.09421	1.09371	1.09806	1.09756	1.08678	1.08628	1.08146	1.08096	1.08195	1.08145
+12.48	+12.47	+12.42	+12.41	+12.53	+12.52	+12.21	+12.20	+12.06	+12.05	+12.08	+12.06
-.23 -.36	-.32	-.39 -.30	-.04	-.30 -.26	-.08	-.18 -.45	-.09	-.30 -.59	-.18	-.31 -.23	-.16
-.08	-.10	-.08	-.09	-.06	-.09	-.25	-.38	-.32	-.38	-.00	.00
+12.17	+12.05	+11.95	+12.28	+12.17	+12.35	+11.78	+11.73	+11.44	+11.49	+11.77	+11.90
13 31.33	31.40	13 30.60	30.76	29.54	30.17	36.52	36.09	13 35.65	36.58	13 35.47	34.93
23 48.5		49.5		50.3		51.7		52.3		52.5	
+10 17.2	17.1	4 +10 18.9	18.7	+10 20.8	20.1	+10 15.2	15.6	+10 16.7	15.8	+10 17.0	17.6
+10 17.2		+10 18.8		22.5		15.4	~~16.x~~	16.2	~~17.x~~	17.3	17.x
+10 18.53 18.94	44.27	+ 18.70 19.13	42.73	+ 19.87 20.31	42.05	+ 16.07 16.53	43.85	+ 16.01 16.46	42.31	+ 17.85 18.30	43.97
+ .41 -26.02	44.34	+ .43 -27.02	42.89	+ .44 -27.82	42.68	+ .46 -29.22	43.42	+ .45 -29.82	43.24	+ .45 -30.02	43.25
- 6.00		- 7.00		- 7.80		- 9.20		- 9.80		- 10.00	
+10 12.94	23 44.30	+ 12.13	42.81	+ 12.51	42.36	+ 7.33	43.63	+ 6.66	42.78	+ 8.30	43.50
	23 24.28		22.49		22.34		23.61		22.76		23.48

1875

Apr.	30	47m	17.94s		22′	86.4″
May.	5		17.84	-.10		87.3 +.9
	10		17.74	.10		88.2 .9
	15		17.64	.10		89.0 .8
	20		17.53	.11		89.7 .7
	25		17.42	.11		90.3 .6
	30		17.31	.11		90.7 .4
June	4		17.19	.12		91.1 .4
	9		17.07	.12		91.4 .3

1875 s
α 14.876
δ +23 2 2.46
dα/dt +3.188
dδ/dt -20.025

Log cos δ 9.76519
log b .12562
log b′ 9.89071

× 1874
-22
May 27
+2.83
11 46 12 45 44.8
-4.7 48.0
8.3 51.0 47
15.3
19.0
22.5
26.1 46 42.0
29.6 45.5
36.6 48.4
40.1
43.8
24.72 45 48.27
46 22.47 3 46 45.30
+57.62
-.31
22.447
47 13.789
-51.30 29 -2.05
+ 51.68
− .40
− 2.05 +1.138
+ 49.243 13 37.23
46 22.45 +10 15.68 +.4
47 11.68 -10.10
11.888 23 43.21
+54 6
s
+34.20 -22.83
5
-2.17
3 54.0 4 37.0
1.0 42.9
115.0 79.9
8 57.50 9 39.95
1.53403 1.35851n
1.40914 1.03362n
+25.65 -17.12
9 23.15 9 22.83
13 25.20 25.52
25.36
1 20 0 37
1.08860n 1.08820n
-5.98
1.08262 1.08222
+12.10 +12.09
-.31 -.22 -.14
-.00 -.00
+11.79 +11.95
13 36.79 37.47
5.26
+10 15.0 15.1
+10 15.4
+10 15.31 1.576 42.65 -16
+ 45.30.12 43.13 +
− 16.10
+10 5.66 23 42.89 -16
23 22.89

1875
-23
May 3
-23.71
46 56.0 46 46.0
59.8 48.8 47
3.3 52.0
10.3
13.9
17.4
21.1 47 33.5
24.6 36.6
31.8 39.9
35.3
38.7
31.22
120
19.22 46 48.93
47 17.464 47 36.67
17.473 +0.79
17.447 -.82
47 17.887 -2.99
-0.482 14.93
+ 0.76
− .33
− 2.99
− 2.56 39 35.59
47 17.45 -16 7.86 +.6
47 14.89 -4.50
23 23.83
+28.54 -19.20
40
-2.78
2 56.0 3 32.9
9.0 46.1
125.0 79.0
43 2.50 43 39.50
1.45545 1.28330n
1.34616 1.17401n
+22.19 -14.93
43 24.69 43 24.57
39 23.66 23.78
23.72
0 46 0 9
1.08830 1.08790n
+3.91
1.09221 1.09181
+12.37 +12.36
-.21 -.49 -.10
-.30 -.37
+11.86 +11.89
39 35.52 35.67
23 2.70
-16 7.9 7.89
+8.5
-16 8.6
82.3 7.65 23.37 -16
.58 23.52 +
4.50
12.15 23.44 −

-.37 -.20
May 5
-51.31
46 56.8 46 39.4 46
0.4 47 42.5
3.9 45.7 47
10.9
14.4
18.0
21.6 47 28.0
25.2 30.3
32.3 33.3
35.6
39.3
25.84
60
19.84 46 42.53
47 18.036 47 30.53
+0.63
18.010 -.52
47 17.84 -.34
+0.17 -2.96
14.82
+ 0.44
− .72
− 2.96
− 3.24 34.95
47 18.01 -16 7.09 +.5
47 14.77 -4.80
23 23.56
+35.51 -12.49
40
-2.70
2 50.6 3 28.3
3.9 42.1
114.5 70.4
42 57.25 43 35.20
1.55035 1.09656n
1.44106 0.98727n
+27.61 -9.71
43 24.86 43 25.49
39 23.49 22.86
23.17
+1.18
1.08948 1.08908
+12.29 +12.28
-.32 -.50 -.04
-.29 -.36
+11.68 +11.88
39 35.17 34.74
27.3
7.9 7.4
7.6
7.46 6.90 23.47 -16
.56 23.04 +
4.80
11.70 23.25 −

-.32
May 13
-3.10
46 55.3 46 46.4 46
58.8 48.9
2.3 51.9 47
0.4
13.0
16.5
20.1 47 49.1
23.6 51.6
30.6 55.0
34.1
37.7
30.14
120
18.14 46 49.07
47 16.491 47 51.90
+1.60
16.465 -.45
47 17.687 -2.79
-1.221 14.882
+ 1.58 .82
− .43
− 2.79
− 1.64 35.17
47 16.46 -16 5.46 +.6
47 14.82 -6.20
23 24.11
+27.42 -35.41
40
-2.38
2 55.3 3 43.7
12.5 0.4
127.8 104.1
43 3.90 43 52.05
1.43807 1.54913n
1.32878 1.43984n
+21.32 -27.53
43 25.22 43 24.52
39 25.13 23.83
23.48
+.56
1.08886 1.08846
+12.27 +12.26
-.20 -.57 -.32
-.28 -.35
+11.79 +11.59
39 34.92 35.42
28.7
6.2 6.7
6.5
5.90 5.41 23.31
.49 23.81
6.20
11.61 23.56

-.32
May 17
-3.40
46 54.9 46 42.4 46
58.3 46.2
1.9 49.9 47
9.1
12.4
16.0
19.5 47 23.8
23.1 26.4
30.4 29.4
33.9
37.4
29.69
120
17.69 46 46.17
47 16.082 47 26.53
+1.93
16.056 -.45
47 17.670 -2.72
-1.584 14.82
+ 1.93
− .48
− 2.72
− 1.27 35.92
47 16.06 -16 6.47 +.4
47 14.79 -6.80
23 23.05
+29.91 -10.45
40
-2.26
2 52.9 3 24.0
9.7 40.9
122.6 64.9
43 1.30 43 32.45
1.47582 1.01912n
1.36653 0.90983n
+23.15 -8.12
43 24.45 43 24.33
39 23.90 24.02
23.96
+4.80
1.09310 1.09270
+12.39 +12.38
-.24 -.42 -.03
-.27 -.31
+11.88 +12.04
39 35.78 36.06
29.3
6.5 6.8
6.6
− 6.87 6.40 22.58
+ .47 22.86
∗ − 6.80
− 13.20 22.72

-.49
May 23
-5.00
46 54.6 46 38.9
54.4 42.7
1.2 45.8
8.2
11.7
15.3
18.9 47 32.1
22.4 35.5
29.5 40.7
32.9
36.6
28.81
120
16.81 46 42.47
47 15.282 47 36.16
+2.81
15.256 -.69
47 17.476 -2.58
-2.210 14.80
+ 2.81
− .70
− 2.58
− 0.47 34.96
47 15.26 -16 4.80 +.4
47 14.79 -7.60
23 22.98
+32.81 -20.82
40
-2.13
2 47.8 3 30.0
10.8 52.3
118.6 82.3
42 59.30 43 41.15
1.51601 1.31848n
1.40672 1.20919n
+20.57 -16.19
43 24.81 43 24.96
39 23.54 23.39
23.46
0 49 0 7
1.08830 1.08790n
-8.23
1.08007 1.07967
+12.02 +12.01
-.28 -.50 -.12
-.27 -.33
+11.47 +11.56
39 35.01 34.95
30.1
4.9 4.8
4.9
− 5.14 4.70 22.71
+ .44 22.65
∗ − 7.60
− 12.30 22.68

8

Gr. 4163 L. C.
11h 48m 44 sec.
106° 18′
73 42,
7 = −63 55
ing = −90

1874
α 48 43.47
δ 42 32.28 17 27.72
$\frac{d\alpha}{dt}$ +2.852
$\frac{d\delta}{dt}$ +20.00

1875
48 46.27
42 52.27
+ 2.850
− 19.99

7.73 corr α =
corr δ =
log δ = −3.42 3.56
s
I = 7.34
K = +.054

l cos δ 9.44819n 9.44819n
l c .10992 .12662
l c′ 9.55811n 9.57371n
l sin δ 9.98218

1874	m	s		′	″	
May 10	48	39.55		42	17.6	
15		39.92	+37		17.1	−.5
20		40.31	39		16.8	.3
25		40.71	40		16.7	.1
30		41.12	41		16.6	.1
1875						
Apr 29	48	41.64		42	41.1	
May 4		41.96	+32		40.3	−.8
9		42.31	35		39.7	.6
14		42.68	37		39.2	.5
19		43.07	39		38.9	.3
24		43.47	40		38.7	.2
29		43.88	41		38.6	.1

1874 −20 May 10 −199 | 1874 −18 −08 May 19 −265 | +1s 1875 −37 −20 May 5 −513 | −32 May 13 −310 | −32 May 17 −340 | −43 May 22 −426

11 47 42.6 48 9.0 47 36.3 47 31.0 48 48 23.2 48 48 48.1 48 48 21.0 48 48 33.9
46.5 40.2 24.4 25.5 25.0 24.5
50.3 43.8 28.0 29.2 29.0 28.2
54.0 47.2 31.6 32.9 32.4 32.1
57.8 51.1 35.0 35.9 49 31.0 36.2 35.7
1.2 54.7 39.2 39.7 40.0 39.3
4.4 58.6 48 17.0 42.9 49 6.0 43.3 48.3 48 59.4 42.9
8.3 2.3 26.1 46.4 13.0 47.0 47.2 46.6
12.0 5.8 35.4 50.1 19.4 50.8 50.9 50.5
53.8 54.4 54.9 54.1
27 71 34 00 35 14 35 87 35 89 35 39
240 120
5 1 7 1 48 9.00 46 0 0 47 31.00 48 23.20 4 48 48.10 48 21.00 48 33.90
47 57.456 47 51.111 48 26.17 48 39.044 49 12.80 13 48 39.856 49 31.00 48 39.878 48 59.40 48 39.322
57.510 51.165 39.098 40 39.910 39.932 39.376

+41.53 +48.17 + 0.63 +1.60 +1.93 +2.46
57.510 +.68 51.165 +62 39.098 40 +1.27 39.910 +1.09 39.932 +1.09 39.376 +1.47
+28 +.71
+ 41.51 48 +3.95 + 48.10 +3.28 + 0.44 +4.28 + 1.58 +3.70 + 1.93 +3.39 + 2.45 +3.00
+ .68 48 43.67 + .91 43.5 21 + 1.75 48.99 6 + 1.06 46.30 + 1.16 46.34 + 1.45 46.31
+ 3.95 +6.80 + 3.28 +6.13 .51 + 4.28 + 3.70 + 3.39 + 3.00
+ 46.14 + 52.29 + 6.47 + 6.34 + 6.48 + 6.90
47 54.51 47 51.16 48 39.10 48 39.91 48 39.93 48 39.38
48 43.65 7 17.92 48 43.45 7 24.93 48 45.57 6 33 23.41 48 46.25 24.40 48 46.41 21.76 48 46.28 24.84
46.50 +10 19.85 46.30 +10 16.17 −16 7.09 −16 5.46 −16 6.47 −16 5.57
+ 2.2 +2.1 +2.3 + 2.2 + 2.2 + 2.1
− 14.70 −15.40 −12.20 −13.00 −13.30 −13.60
106 17 25.27 17 27.80 17 6.42 17 8.14 17 4.19 17 7.77

−11.54 + 20.11 −35.06 +15.84 −33.76 − 8.24 − 51.14 +18.88 −19.52 + 5.42
15 15 50 50 50 50
1 − 2.13 −2.20 −2.70 −2.38 −2.26 −2.17
2 24.8 2 28.0 1 8.2 1 19.7 1 1.7 1 6.9 0 52.2 1 21.0 1 7.4 1 4.5 0 46.7
26.9 26.3 6.3 36.2 17.8 27.8 12.9 42.0 27.8 31.2 13.9
51.7″ 54.3 14.5 55.9 19.5 34.7 12.51 63.0 35.2 35.7 12.06
17 25.85 17 27.15 16 7.25 51 27.95 51 9.75 51 17.35 51 2.55 51 31.50? 51 17.60? 51 17.85 51 0.30

1.06221n 1.30341 1.54481n 1.19976 1.52840n 0.91593n 1.70876n 1.27600 1.29048n 0.73400
0.62032n 0.86152n 1.10292n 0.75787n 1.08651n 0.48964 1.28247 0.83411n 0.84859n 0.30771n
+ 4.17 − 7.27 + 12.64 − 5.73 + 12.21 +3.09 + 19.16 + 6.82 + 7.06 − 2.03
17 30.02? 17 19.88 16 19.92 51 22.22 51 21.96 51 20.44 51 21.71 51 24.68 51 24.66 51 15.82?
5 18.33 5 28.47 28.43 31 26.13 26.39 31 27.91 26.64 31 23.67 23.69 31 32.53
~~54 41.67?~~ ~~54 31.53~~ ~~31.57 28 33.87~~ ~~33.61 28 32.09~~ ~~32.36 28 36.33~~ ~~36.31 28 27.47~~
5 28.45 26.26 27.27 23.68

(−63 52 50 54 10) 52 20 52 38 52 17 52 30
2.06775n 2.06818n 2.06759n 2.06768n 2.06759n 2.06765n
+ 958 − 168 + 124 + 60 + 483 −1688
2.07776 2.06607 2.06650 2.06683 2.06892 2.06819 2.06828 2.07242 2.07248 2.05071 2.05077
+119.61 +116.43 +116.55 +117.17 +117.20 +117.00 +117.03 +118.15 +118.16 +112.39 ~~+112.40~~
+ .01 + .01 + .01 + .01 + .01 + .01 + .01 0 0 + 3 + 3
+.02 ~~−.01~~ +.06 −.02 +.19 +.03 −.04 +.16 + 2 +.10 +.39 +.05 −.07 +.05 + 1 −.11
−.05 −.03 −.19 −.10 −.15 −.12 −.12 −.09 −.13 −.12 −.12 −.09
+1 59.59 + 1 56.31 +1 56.65 +1 57.06 + 1 57.25 + 1 56.91 + 1 57.34 + 1 58.07 + 1 58.09 + 1 58.31
7 ~~56 41.26~~ 17.92 ~~56 27.84~~ 24.78 ~~28.22~~ 30 3 ~~30.93~~ 23.19 ~~30.86~~ ~~30 29.00~~ 24.82 ~~29.70~~ ~~30 34.40~~ 21.74 ~~34.40~~ ~~30 23.78~~ 4 28.84
+10 19.87 21.79 +16.07 18.05 25.09 −16 7.46 5.03 23.64 − 5.90 3.76 23.98 − 6.87 4.84 21.78 − 5.61 3.66
+ 1.92 −34.69 +1.98 −35.39 + 2.43 + 2.14 + 2.03 + 1.95
− 14.70 − 15.40 − 12.20 − 13.00 − 13.30 − 13.60
+10 7.09 + 10 2.65 −16 19.23 −16 16.76 12.94 − 16 18.14 −16 17.26
17 ~~25.07~~ 17 27.43 27.14 17 5.96 6.41 17 8.06 7.22 3.60 3.64 ~~4.58~~ 7.58
17 27.58 17 6.18 17 7.64 17 3.62 17 ~~4.58~~ 7.58
17 5.01 17 7.58

X

β Virginis 1874 1875

h m sec
11 53 33 α δ 53 32.76
+ 4° 21′ 21 5.24
ϕ +38° 2′ +3.075
ϕ sin z = +.62 −20.05

corr α =
corr δ =

tang δ = +.08
I = 2.07
K = −.015

l cos δ 9.99875 9.99875
l C .10992 .12652
l C′ .10867 .12427

l sin δ 8.87995

1874 1874 1875

May 10 | May 24 | May 27 | May 28 | May 5 | May 13

−.199 | ~~−.268~~ −.272 | −.283 | −.297 | −.518 | −.310

11 52 37.0 52 28.7 | 52 27.9 — | 52 26.9 52 33.6 | 52 26.4 52 24.1 | 53 21.6 53 10.7 | 53 20.4 53 14.3
39.0 30.4 | 30.0 — | 28.8 35.6 | 28.4 26.8 | 23.7 12.8 | 22.4 16.3
41.2 32.1 | 32.0 — | 30.8 37.4 | 30.5 28.0 | 25.8 14.9 | 24.5 18.1
45.3 | 36.1 | 35.0 | 34.6 | 29.9 | 28.6
47.4 | 38.2 | 37.1 | 36.7 | 32.0 | 30.8
49.5 | 40.3 | 39.0 | 38.7 | 34.0 | 32.8
51.4 53 13.3 | 42.3 52 59.0 | 41.1 53 10.4 | 40.9 | 36.0 53 58.0 | 34.8 53 42.2
53.6 15.6 | 44.4 53 1.0 | 43.2 12.2 | 43.0 | 38.1 59.9 | 36.9
57.7 17.2 | 48.6 3.4 | 47.4 14.0 | 47.0 | 42.2 1.7 | 41.0
59.7 | 50.6 | 49.4 | 49.0 | 44.2 | 43.1
1.9 | 52.6 | 51.5 | 51.1 | 46.4 | 45.2

4837 | 4430 | 4302 | 4263 | 3739 | 3604
60

5437 52 30.40 | 52 35.53 | 52 26.30 | 53 12.80 | 53 16.23
52 49.427 53 15.37 | 52 40.273 53 1.13 | 52 39.109 53 12.20 | 52 38.755 | 53 33.991 53 59.87 | 53 32.764 53 42.20

49.412 | 40.258 | 39.094 | 38.740 | 33.976 | 32.749

+ 41.52 | + 50.54 | + 51.68 | + 52.06 | + 0.44 | + 1.58
− .01 | − .02 | − .02 | − .02 | − .04 | − .02
− 1.24 +1.835 | − 1.13 +1.945 | − 1.11 +1.965 | − 1.10 +1.975 | − 1.60 | − 1.55
+ 40.27 | + 49.39 | + 50.55 | + 50.94 | − 1.20 | + 0.01
52 49.41 | 52 40.26 | 52 39.09 | 52 38.74 | 53 33.98 | 53 32.75

53 29.68 | 53 29.65 | 53 29.64 | 53 29.68 | 53 32.78 | 53 32.76
32.755 | 32.725 | 32.715 | 29.662 32.755

+19.03 −25.94 | −20.86 | +3.58 −33.09 | +12.45 | +21.19 −25.88 | +16.53 −9.44
10 | 10 | 10 | 10 | 40 | 40

−2.13 | −2.19 | −2.17 | −2.14 | −2.70 | −2.38
0 29.8 1 27.9 | 1 20.2 | 0 47.5 1 34.9 | 0 33.0 | 4 24.0 0 25.8 | 4 29.1 0 3.7
43.0 41.2 | 32.3 ∩ | 1.2 47.5 | 51.7 | 34.1 37.9 | 43.1 19.6
72.8 69.1 | 52.5 | 108.7 82.4 | 84.7 | 58.1 63.7 | 72.2 23.3
10′ 36.40″ 11 34.55 | 11 26.25 | 10 54.35 11 41.20 | 10 42.35 | 44 29.05 45 31.85 | 44 36.10 45 11.65

1.27944 1.41397n | 1.31931n | 0.55388 1.51970n | 1.09517 | 1.32613 1.41296n | 1.21827 0.97497n
1.38811 1.52264n | 1.42798n | 0.66255 1.62837n | 1.20384 | 1.45040 1.53723n | 1.34254 1.09824n
+24.44 −33.32 | −26.79 | +4.60 −42.50 | +15.99 | +28.21 −34.46 | +22.04 −12.54
11 0.84 11 1.23 | 10 59.46 | 10 58.95 10 58.70 | 10 58.34 | 44 57.26 44 57.39 | 44 58.14 44 59.11

+4° 11 47.51″ 47.12 | 11 48.89 | 11 49.40 49.65 | 11 50.01 | 37 51.09 50.96 | 37 50.21 49.24
47.31 | 49.52 | 51.02 | 49.72

+38 0 19 1 17 | 0 37 1 24 | 0 41 1 44
1.65290 1.65320 | 1.65300 1.65320 | 1.65300 1.65320
+969 | −676 | −579 | −858 | +144 | +74
1.66259 1.66289 | 1.64614 1.64644 | 1.64721 1.64741 | 1.64442 1.64462 | 1.65444 1.65460 | 1.65374 1.65394
−45.98 −46.01 | −44.27 −44.30 | −44.38 −44.40 | −44.10 | −45.13 −45.15 | −45.06 −45.08

−.02 −.04 −.03 | ~~−.06~~ −.02 | −.13 −0 −.02 −.05 | −.01 ~~.06~~ −.01 | −.02 −.27 −.03 | −.01 −.22 −1
−.01 −.03 | −.11 −.11 | .00 .00 | .00 | −.45 −.05 | −.21 .02
−46.01 −46.07 | −44.43 | −44.38 −44.45 | −44.11 | −45.60 −45.23 | −45.48 −45.11
+4 11 1.50 1.05 | 11 4.46 | 11 5.02 5.20 | 5.90 | 37 5.49 5.73 | 37 4.73 4.13
+10 19.87 18.55 | +16.01 14.66 | +15.31 13.97 | +16.63 15.31 | −16 7.46 9.13 | −5.90 7.37
− 1.32 −13.44 | − 1.35 −14.29 | − 1.34 −14.48 | − 1.32 −14.55 | − 1.67 | − 1.47
+6.61 | +5.76 | +5.57 | +5.50 | +8.92 | +8.48
+10 25.16 21 26.66 | + 20.42 | + 19.54 24.56 | + 20.81 | −16 0.21 21 5.28 | −15 58.89 5.85
26.21 | 24.74 | 5.52 | 5.24

21 26.43 | 24.88 | 24.65 | 26.71 | 21 5.40 | 5.54
21 6.38 | 4.83 | 4.60 | 6.66

May 23				May 26				May 27			
	−500				−550				−510		
53	19.0	53	9.0	53	18.7	53	12.8	53	18.6	53	14.7
	21.2		11.5		20.7		14.4		21.6		16.3
	23.2		13.4		22.9		16.4		23.0		18.2
	27.4				26.8				26.9		
	29.3				28.9				29.0		
	31.5				31.0				31.0		
	33.5	53	50.0		33.0				33.0	53	48.5
	35.6		52.1		35.1				35.2		
	39.8		54.0		39.3				39.2		
	41.8				41.4				41.3		
	43.8				43.3				43.3		
	3461				3411				3411		
		53	11.30			53	14.53			53	16.40
53	31.464	53	52.03	53	31.009			53	31.009	53	48.50
	31.449				30.994				30.994		
+	2.81			+	3.22			+	3.29		
−	.04			−	.04			−	.04		
−	1.47			−	1.44			−	1.43		
+	1.30			+	1.74			+	1.82		
53	31.45			53	30.99			53	30.99		
53	32.75			53	32.73			53	32.81		
									32.766		
	+20.16		−20.57		+16.48				+14.61		−17.49
40				40				40			
	−2.13				−2.09				−2.07		
4	22.7	0	16.4	4	28.5			4	30.0	0	12.0
	42.9		39.0		50.3				52.1		37.4
	65.6		55.4		78.8				82.1		49.4
44	32.80	45	27.70	44	39.40			44	41.05	45	24.70
	1.30449		1.31323n		1.21696				1.16465		1.24279n
	1.42876		1.43750n		1.34123				1.28892		1.36706n
	+26.84		−27.38		+21.94				+19.45		−23.29
44	59.64	45	−0.32	45	1.34			45	0.50	45	1.41
37	48.71		48.03	37	47.01			37	47.85		46.94
	48.37								47.39		
								0	53	1	37
									1.65310		1.65320
	−800				−1329				−1036		
	1.64500		1.64520		1.63971		1.63991		1.64274		1.64284
	−44.16		−44.18		−43.62				−43.93		−43.94
	−.02	−.24	−.02		−.01		~~−.21~~		−.01	~~−.24~~	−.01
	−.40		−.04		−.41		−.42		−.42		−.04
	−44.58		−44.24		−44.04				−44.36		−43.99
37	4.13		3.79	37	2.97			37	3.49		2.95
−16	5.14	6.46		−	3.47		4.76	−	4.01	5.29	
−	1.32			−	1.29			−	1.28		
	+7.86			+	~~7.68~~ 78			+	~~7.62~~ 80		
−15	58.60		5.53	−	56.98			−	57.49		6.00
			5.19								5.46
	5.36				5.79				5.73		

67 Ursae Majoris
h m sec
11 55 45
+43° 44'
z = −1° 21'
sin z = −.02

1874
l cos δ 9.85888
l.b .10992
l.b' 9.96880
l sin δ 9.83967

1875
55 45.62
44 19.49
+ 3.067
− 20.01
9.85888
.12552
9.98440

cos α =
cos δ =
tang δ = +.96
I = 2.85
k = −.021

1874				1874		1875					
May 10		May 24		May 27		May 5		May 13		May 23	
+.199		~~−.268~~ −.272		−.283		−.513		−.310		−.500	
11 54 46.2	54 37.6	54 36.9	54 23.5	54 35.8	54 28.8	55 —	55 28.7	55 29.6	55 20.2	55 28.4	55 16.6
49.0	40.0	39.9	26.5	38.7	31.5	—	23.3	32.6	23.1	31.3	19.6
51.9	42.9	42.8	28.8	41.6	34.0	—	25.8	35.9	25.0	34.0	22.5
57.4		48.4		47.2		46.11 42.4		41.1		39.8	
0.4		51.2		50.2		7.95 45.1		43.9		42.7	
3.3		54.2		53.0		8.10 48.1		46.8		45.5	
6.2	55 19.6	57.0	55 10.3	55.8	55 17.6	05 50.9	56 7.3	49.7	55 54.2	48.3	56 11.0
9.0	22.1	59.8	13.9	58.7	21.1	25 53.9	9.4	52.5	59.6	51.2	13.0
14.8	24.4	5.5	15.7	4.4	23.2	40 59.5	12.0	58.3	2.6	56.8	14.4
17.7		8.4		7.3		15 2.4		1.2		59.8	
26.5		11.2		10.1		30 5.4		3.9		2.8	
2764		4153		4028				3950		4406	
240		180		180				120		60	
364	54 40.17	5953	54 26.27	5848	54 31.43		55 23.27	5150	55 22.77	5006	55 19.57
55 3.309	55 22.03	54 54.118	55 13.30	54 53.164	55 ~~20.97~~ 20.63	55 48.119	56 9.57	55 46.818	55 59.80	55 45.509	56 12.80
55 3.288		54.097		53.143		48.098		46.797		45.488	
+ 41.52		+ 50.54		+ 51.68		+ 0.44		+ 1.58		+ 2.81	
− .19		− .26		− .27		− .49		− .30		− .48	
− 1.99 41.077		− 1.78 +1.287		− 1.73 +1.337		− 2.46		− 2.35		− 2.20	
+ 39.34		+ 48.50		+ 49.68		− 2.51		− 1.07		+ 0.13	
55 3.29		54 54.10		54 53.14		55 48.10		55 46.80		55 45.49	
55 42.63		55 42.60		55 42.82		55 45.59		55 45.73		55 45.62	
45.697		45.667		42.683	45.887					45.647	

+23.14	−18.72	+27.85	−19.18	+21.73	~~−37.81~~ 47	+ 24.85	− 21.45	+ 24.05	− 12.98	+ 25.94	− 26.29
45		45		45		20		20		20	
−2.13		−2.19		−2.17		−2.70		−2.38		−2.13	
2 59.1	3 37.2	2 43.9	3 33.9	2 54.6	3 40.7	1 50.1	2 34.9	1 50.2	2 24.7	1 44.8	2 34.8
9.4	47.3	57.5	40.6	3.8	48.8	1.8	46.8	6.8	40.9	5.8	56.3
1285	845	1014	745	1184	895	1119	817	1170	656	1106	911
48 4.25	48 42.25	47 50.70	48 ~~40.30~~ 37.23	47 59.20	48 44.75	21 55.95	22 40.85	21 58.50	22 32.80	21 55.30	22 45.55
1.36436	1.27231n	1.44483	1.28285n	1.33706	1.57761n	1.39533	1.33143n	1.38112	1.11327n	1.41397	1.41979n
1.33316	1.24111n	1.41363	1.25165n	1.30586	0.54641n	1.37973	1.31583n	1.36552	1.09767n	1.39837	1.40419n
+21.53	−17.42	+25.92	−17.85	+20.22	−35.19	+23.97	−20.69	+23.21	−12.52	+ 25.03	− 25.36
48 25.78	48 24.83	48 16.62	48 19.40	48 19.42	48 ~~41.23~~ 9.56	22 19.92	22 20.16	22 21.71	22 20.28	22 20.33	22 20.19
+43° 34' 22.57"	23.52	34 31.73	28.95	34 28.93	7.72	0 28.43	0 28.19	0 26.64	28.07	0 28.02	28.16
23.04		30.34			38.79	28.31		27.35		25.09	
−1 22 13	21 35	22 26	21 40			21 52	21 7			21 53	21 3
0.13900n	0.13580n	0.14080n	0.13630n			0.13740n	0.13370			0.13740n	0.13310n
+974		−665		−571		+155		+82		−791	
.14874	0.14554	0.13335	0.12965	.13429	.13059	.13895	.13465	.13822	.13392	.12949	0.12519
+ 1.41	+1.40	+1.36	+1.35	+1.36	+1.37	+1.38	+1.36	+1.37	+1.36	+1.35	+1.33
−.14 −.18	−.10	−.20 −.40	−.10	−.12 ~~−.06~~ −.12		−.16 −.37	−.12	−.15 −.30	−.05	−.18 −.39	−.18
−.06	−.07	−.22	−.29	.00	.00	−.19	−.27	−.18	−.23	−.17	−.25
+1.21	+1.23	+0.94	+0.96	+1.24		+1.03	+0.97	+1.04	+1.08	+1.00	+0.90
+43 34 23.78	24.75	34 32.67	29.91	34 30.17		0 29.46	29.16	0 27.68	29.15	0 29.02	29.06
+10 19.87	19.91	+16.01	16.05	+ 15.31	15.35	−16 7.46	7.41	− 5.90	5.85	− 5.14	5.10
+ .04	−24.54	+ .04	−26.54	+ .04	−26.88	+ .05		+ .05		+ .04	
− 4.53		− 6.53		− 6.87		−1.62		−2.94		−4.50	
+10 15.38	39.16 40.13	+ 9.52	42.19 39.43	+ 8.48		−16 9.03	20.43 20.13	− 8.79	18.89 20.36	− 9.60	19.92 19.46
44 39.64		40.81		38.65		44 20.28		19.62		19.44	
44 19.63		20.80		18.64							

98

o Virginis
h m s app. prec.
11 58 30
+9° 26′
ζ = +32° 57′
f sin ζ = +.54

1874				
Apr. 30	58m 48.80s		25′ 51.8″	
May 5	48.77	−.03	52.2	+.4
10	48.74	.03	52.6	.4
15	48.71	.03	53.0	.4
20	48.67	.04	53.4	.4
25	48.63	.04	53.8	.4
30	48.59	.04	54.1	.3
June 4	48.54	.05	54.5	.4
9	48.49	.05	54.8	.3

	1874	1875
α	47.420	50.479
δ	+25 57.95	+25 37.93
	+3.059	+3.059
	−20.018	−20.018
l cos δ	9.99409	9.99409
l c,	.10992	.12552
l c′	.10401	.11961
l sin δ	9.21458	

cos α =
cos δ =
tang δ = +.17 101
s
I = 2.09
s
k = −.016

× 1874 −.11 May 7 f −.105	× −.20 May 10 f −.199	× −.18 May 11 f .155	× −.15 −.04 May 13 f −.164	× 1874 −.28 May 24 f ~~−.268~~ −.272	1875 −.37 −.20 May 5 −.513
58 — — — 5.7 7.7 10.0 12.0 14.1 — — —	57 54.7 56.8 59.0 3.0 5.1 7.2 9.3 11.4 15.7 17.7 19.9	57 53.7 55.8 58.0 2.2 4.2 6.3 8.3 10.3 14.5 16.7 18.8	57 51.6 53.7 55.8 59.9 1.9 4.1 6.1 8.2 12.4 14.6 16.7	57 45.6 47.6 49.8 54.0 56.1 58.2 0.2 2.4 6.5 8.6 10.7	58 39.3 41.4 43.4 47.6 49.6 51.8 53.9 56.0 0.1 2.2 4.4
58 27.5 29.8 32.0 8	57 43.0 45.9 47.9	57 46.3 48.7 50.5 58 25.7 27.4 29.1	57 38.9 41.1 42.5 58 19.9 22.1 23.5	57 33.8 36.1 37.8 58 15.0 17.4 19.5	58 32.2 34.0 35.7 59 16.0 17.8 19.7
495	2598 180	2488 180	2850 240	3397 300	3897 180
58 29.77 58 9.900 +38.85 −.02 9.884 58 48.76 −38.88 −1.34 58 47.37	7.98 58 7.255 57 45.60 +41.53 −.03 7.239 58 48.74 −41.50 −1.32 47.42	6.88 58 6.255 57 48.50 58 27.40 +42.48 −.03 6.239 58 48.73 −42.49 −1.31 47.38	45.0 58 4.091 57 40.83 58 21.83 +44.71 −.03 40.75 58 48.72 −.04 ~~58~~ 44.65 −1.30 47.42	63.97 57 58.155 57 35.90 58 17.30 +50.56 −.05 58.139 58 48.64 −50.50 −1.22 47.43	56.97 58 51.791 58 33.97 59 17.83 +0.63 −.06 51.775 58 52.16 −.20 −0.39 −1.68 50.47
+ 38.84 − .02 − 1.34 +1.719 + 37.48 15 34.90 58 9.88 +10 19.93 −1.2 58 47.36 +5.60 50.419 25 59.23	+ 41.52 − .03 − 1.32 +1.739 + 40.17 35.71 58 7.24 +10 19.85 −1.2 58 47.41 +5.40 50.469 25 59.76	+ 42.47 − .03 − 1.31 +1.749 + 41.13 37.08 58 6.24 +10 17.28 −1.2 58 47.37 +5.30 50.429 25 58.46	+ 44.64 − .03 − 1.30 +1.759 + 43.31 32.22 58 4.07 +10 22.55 −1.2 58 47.38 +5.10 50.439 25 58.67	~~+4~~ + 50.54 .05 − 1.22 +1.839 + 49.27 15 38.14 57 58.14 +10 16.26 −1.1 58 47.41 +4.30 50.469 25 57.60	+ 0.44 − .09 − 1.68 ~~+1.379~~ − 1.33 41 38.63 58 51.77 −16 7.09 −1.4 58 50.44 +7.80 25 37.94
5 −19.87 −2.08 1 53.0 7.8 120.8 7 0.40	5 +21.65 −2.13 0 59.9 14.0 133.9 6 6.95	5 +17.75 −2.14 0 2.7 16.7 19.4 5 0 ~~14.70~~ 9.70 (6) −21.15 1 52.4 6.2 118.6 6 59.30	5 +23.26 −2.18 0 58.9 21.1 140.0 6 10.00 −17.74 1 50.9 13.7 124.6 7 2.30	5 +22.25 −2.19 0 59.0 10.2 129.2 6 4.60 −19.15 1 52.1 4.1 116.2 6 58.10	40 +17.82 −2.70 0 3.3 14.1 17.4 40 8.70 −26.84 1 0.9 12.1 13.0 41 6.50
1.29820n 1.40221n −25.25 6 35.15	1.33546 1.43947 +27.51 6 34.46	1.24920 1.35321 +22.55 5 32.23 (6) 1.32531n 1.42932n −26.88 6 32.42	1.36661 1.47062 +29.56 6 39.56 1.24895n 1.35296n −22.54 6 39.76	1.34733 1.45134 +28.27 6 32.87 1.28217n 1.38628n −24.33 6 33.77	1.28091 1.37052 +23.47 40 32.17 1.41564n 1.53525n −34.30 40 32.20
+9° 16 13.20 +32 56 43 1.57170 +1077 1.58247 −38.24	16 13.89 55 50 1.57140 +981 1.58121 −38.13	16 16.10 16.01 +32 55 53 1.57150 +1698 1.58848 −38.77 15.93 56 42 1.57170 1.58868 −38.79	16 8.79 8.69 1.55990 −36.30 8.59 −1160 1.56010 −36.32	16 15.48 15.03 55 48 1.57150 −651 1.56499 −36.73 16 14.58 56 42 1.57170 1.56519 −36.74	42 16.18 16.16 56 21 1.57160 +169 1.57329 −37.43 16.15 57 19 1.57190 1.57359 −37.46
−.02 ~~−.03~~ −.06 −.04 −38.30 15 34.90 25 52.4 +10 17.8 +10 17.5 +10 19.51 18.39 − 1.12 −14.42 + 5.60 +10 23.99 25 58.89 25 38.87	−.03 ~~−.02~~ −.05 −.02 −38.18 15 35.71 52.6 16.9 16.9 + 19.87 18.72 − 1.15 −14.62 + 5.40 + 24.12 59.83 39.81	−.02 −.16 −.10 −38.89 15 37.21 52.7 15.3 15.5 + 16.67 15.52 58.03 − 1.16 −14.72 57.77 + 5.30 + 20.82 −.03 −.16 −38.98 36.95 57.90 37.88	−.04 .16 −.09 −36.43 15 32.36 52.9 20.5 20.6 + 22.17 21.00 58.46 − 1.17 −14.92 58.19 + 5.10 + 26.10 −.02 −.18 −36.50 32.09 20.8 58.32 38.30	−.03 .15 −.09 −36.85 15 38.63 53.7 13.1 15.6 + 16.01 14.83 57.76 − 1.18 −15.72 56.79 + 4.30 + 19.13 −.02 −.16 −36.92 37.66 16.0 57.27 37.25	−.02 .09 −.01 −37.46 41 38.72 25 30.1 −16 8.6 −16 8.5 −16 7.46 8.91 37.61 − 1.45 37.43 + 7.80 +16 1.11 25 37.52 −.04 −.11 −37.61 38.54 8.4

1875

			m	s			'	"	
Apr.	30	58		52.19		25		29.7	
May	5			52.16	-.03			30.1	+.4
	10			52.13	.03			30.5	.4
	15			52.10	.03			30.9	.4
	20			52.06	.04			31.3	.4
	25			52.02	.04			31.7	.4
	30			51.98	.04			32.0	.3
June	4			51.93	.05			32.4	.4
	9			51.88	.05			32.7	3

1875

-.52
May 27
-.510

-148
June 1
-1500

58 — 58 539 58 — No 6
— 558 —
— 574
446 454
467 475
488 497
508 519
530 539
— —
— —
— —

2439 58 55.70 2484
58 48.780 58 49.680

48.764 +3.32 49.664 +2.41
58 52.00 -09 58 51.976 -.08
-3.24 -2.310
-1.52 -1.48
+ 3.29 50.47 + 2.38 50.57
- .09 - .08
- 1.52 - 1.48
+ 1.678 + 0.82
58 48.76 41 3695 58 49.66 -
-16 359 -16 630
58 50.434 -1.3 58 50.48 -7.2
+610
+9 25 38.16

-6.92
40
-2.07
0 33.0
55.0
88.0
40 44.00

0.84011 m
0.95972 m
-9.11
40 34.89

42' 13.46

-999
1.5616 1.56191
-36.44

-01 ~~03~~
-06 -.07
-36.51
41 3695
31.8
-16 51
-16 51
-16 401 5.12
- 111
+ 610
-15 59.02 25 37.93

A.R.

Gr. 1852. Groom 99
h m sec
11 38 52

1874 +77° 36′ 1875
α 48.871s Z-35″ 13′ 52.019
δ +36′ 36.4″ ℓsing = -.58 +36′ 16.23
dα/dt +3.148s +3.147
dδ/dt -20.168″ -20.168
ℓcosδ 9.33190 9.33190
ℓC .10992 .12552
ℓC′ 9.44182 9.45742
1874

1874
May 20 58m -54.57s 35′ 109.3″
25 54.17 -.40 109.9 +.6
30 53.77 .40 110.3 .4
June 4 53.35 .42 110.6 .3
9 52.93 .42 110.7 .1

1875
Apr 30 58m 59.82s 35′ 83.6″ +1.0
May 5 59.51 -.31 84.6 .9
10 59.17 .34 85.5 .8
15 58.81 .36 86.3 .8
20 58.43 .38 87.0 .7

corrα = +.040s
corrδ = +1.32″
ℓsinδ = 9.98975
tangδ = +4.55
I = 9.61s
k = -.072s +

1874 May 10 Ch.f. — May 11 Ch.f. — May 24 — May 27 -.22 -.283 — +1874 May 28 -.31 ~~-.2[illegible]~~ -.297 — 1875 May 13 -.32 -.310

57 44.5 56 59.6 57 44.2 57 2.7 58 39.8 57 53.2
49.3 57 8.3 49.2 10.3 44.4 59.2
54.3 14.2 58.7 18.7 49.3 9.1
59.2 58.7 53.8
3.7 3.3 58.7
8.6 8.2 3.8 58 56.9
13.6 58 27.8 12.9 58 16.0 8.5 5.5
18.1 37.7 17.9 24.6 13.2 15.0
22.9 44.3 22.6 34.1 18.1

2742 2707 2896
240 240 240
342 57 7.37 307 57 10.57 5296 58 0.50
58 3.800 58 ~~39.93~~ 58 3.411 58 24.90 58 58.844 59 5.80
3660

3.728 +51.63 3.339 +52.11 58.772 +1.61
58 ~~54.05~~ 3.99 -1.00 58 53.951 -1.41 58 58.974 -1.46
-50.30 26 - 50.61 57 -0.2017
-50.30 -5.12 - 50.61 -5.04 -0.21 -6.92
58 49.24 ~~48.98~~ 49.00 52.00
+ 51.68 + 52.06 49.00 + 1.58
- 1.29 - 1.61 35 - 1.41
- 5.12 -1.972 - 5.04 1.892 - 6.92
+ 45.27 26 34.22 + 45.67 26 33.25 - 6.75 52 31.19
58 3.73 +10 15.68 58 3.34 +10 17.05 58 58.77 16 5.46
+12 +12 +14
58 49.00 -13.70 58 49.01 -13.80 58 52.02 -9.80
52.148 77 36 37.40 52.158 36 37.70 36 17.33

32.80
+56.43 ~~-36.13~~ +52.84 -21.49 30 +58.34 -6.96

55 55 55 55 55

-2.17 -2.14 -2.38

2 9.6 2 16.6 2 10.4 1 36.7 1 1.9 1 37.0 1 58.0 -0 32.2 0 51.0
14.8 21.4 12.2 39.4 4.9 42.8 4.0 49.7 8.0
24.4″ 38.0 22.6 76.1 6.8 79.8 122.0 81.9 119.0
57 12.20 57 19.00 57 11.30 56 38.05 56 (57) 3.40 56 39.90 57 1.00 30 40.95 30 59.50

1.75151 1.51587n 1.72296 1.33224n 1.76597 0.84261n
1.19333 0.95769n 1.16478 0.77406n 1.23339 0.30013n
+15.61 -9.07 +14.61 -5.94 +16.72 -1.99
56 53.66 56 54.33 56 54.51 56 55.06 30 57.67 30 57.51

+77° 25′ 54.69″ 54.02 25 53.84 53.29 57 50.68 50.84
54.35 53.56 1 50.76
-35 13 39 13 14 13 37 13 16 13 7 12 49
1.60900n 1.60890n 1.60900n 1.60890n 1.60880n 1.60870n
-557 -840 +93
1.60343 1.60333 1.60060 1.60050 1.60973 1.60963
+40.13 +40.12 +39.87 +39.86 +40.71 +40.70

-.39 -.25 -.12 -.31 -.18 -.05 -.38 -.27 1
.00 .00 .00 .00 -.06 -.09
+39.74 +40.00 +39.56 +39.81 +40.27 +40.60
26 34.43 34.02 33.40 33.10 53 30.95 31.44
36 50.1 50.2 2 26.0
+10 15.7 16.1 16.8 17.1 -16 56.9 5.4
+10 16.9 16.9 -16 5.1 6.3
+10 15.31 16.56 37.29 +16.63 17.87 37.47 -16 5.90 4.52 16.56
+ 1.25 33.87 36.88 + 1.24 33.97 37.17 + 1.38 17.04 .12
- 13.70 -13.80 9.80
+ 10 2.86 36 37.08 + 4.07 37.32 16 14.32 16.87
36 17.91 17.15

1874

α Corvi. α δ $\frac{d\alpha}{dt}$ $\frac{d\delta}{dt}$

12h 1m 58sec

−24° 2′

z = +66° 25′

δ sin z = +.92

l cos δ 9.96062
l.6 .10992
l.6′ .07054

l sin δ 9.60998n

cos α =
cos δ =

tang δ = −.45

I = 2.25s

k = −.017s

1874

	May 7		May 10		May 11		May 24		May 27		May 28	
	−.105		−.199		−.155		~~−.268~~ −.272		−.283		−.297	
	1 3.7	0 48.5	1 1.0	0 50.0	1 9.0	1 16.4	0 57.9	0 39.7	0 50.7	0 41.7	0 50.3	0 38.3
	6.1	50.9	3.2	52.4	10.2		54.1	41.2	52.8	43.7	52.6	39.9
	8.4	53.4	5.6	54.5	11.3		56.4	43.1	55.1	45.8	54.9	41.9
	13.0	+	10.0		12.5		0.8		59.7		59.3	
	15.7		12.3		13.7		3.0		1.8		1.7	
	17.4		14.5		14.6		5.4		4.1		3.9	
	19.5	1 37.7	16.8	1 30.6	15.8		7.6	1 20.9	6.4	1 24.7	6.1	1 15.9
	21.9	40.0	19.0		16.9		9.9	22.9	8.7	26.3	8.4	18.4
	26.4	41.9	23.5		18.2		14.5	24.9	13.2	28.4	12.7	20.1
	28.6		26.0				16.7		15.5		15.1	
	31.0		28.2				19.0		17.7		17.3	
							239.3		285.7			
	191.1		160.1		122.2		~~244.3~~		285.9		282.3	
							180		240		240	
		0 50.93		0 52.30		1 16.40	5.93	0 41.33	4.57	0 43.73	4.23	0 40.03
	1 17.373	1 39.87	1 14.555	1 30.60	1 13.578		1 ~~5.845~~	1 22.90	1 ~~4.173~~	1 26.47	3.845	1 18.13
							5.391		4.155			
	17.356		14.538		13.561		5.374		4.138		3.828	
	+ 38.84		+ 41.52		+ 42.47		+ 50.54		+ 51.68		+ 52.06	
	+ .05		+ .09		+ .07		+ .12		+ .13		+ .13	
	− 1.12	+1.961	− 1.10	+1.981	− 1.09	+1.991	− 0.98	+2.101	− 0.95	+2.131	− 0.94	+2.141
	+ 37.77		+ 40.51		+ 41.45		+ 49.68		+ 50.86		+ 51.25	
	1 17.36		1 14.54		1 13.56		1 5.37		1 4.14		1 3.83	
	1 55.13		1 55.05		1 55.01		1 55.05		1 55.00		1 55.08	
	58.211		58.131		58.091		58.131		58.081		55.053	58.161
	+26.44	−22.50	+22.25	−16.05	−2.82		06 +24.51	51 −17.06	2 +20.44	2 −22.30	+23.81	−14.29
	30		30		30		30		30		30	
	−208		−213		−214		−219		−217		−214	
	1 59.5	2 56.1	2 3.9	2 57.0	2 29.0		2 7.4	2 55.1	2 9.7	2 57.2	2 4.7	2 49.1
	15.9	14.2	20.5	7.9	46.6		21.9	11.4	26.9	16.0	24.0	9.4
	135.4	130.3	24.4	118.9	75.6		29.3	126.5	36.6	135.2	28.7	118.5
	33 7.70	33 5.15	32 12.20	32 59.45	32 37.80		32 14.70 65	33 3.25	32 18.30	33 7.60	32 14.35	32 59.25
	1.42226	1.35218n	1.34733	1.20548n	0.45025n		1.38130	1.24329n	1.31006	1.34869n	1.37676	1.15503n
	1.49280	1.42272n	1.41787	1.27602n	0.52069n		1.45184	1.31383n	1.38060	1.41923n	1.44730	1.22557n
	+ 31.10	−26.47	+26.17	−18.88	−3.32		+28.31	−20.65	+24.02	−26.26	+28.01	−16.81
	32 38.80	32 38.28	32 38.37	32 41.57	32 34.48		32 42.96	32 42.60	32 42.32	32 41.34	32 42.36	32 42.44
−24°	9′ 50.45″	50.33	9 50.02	52.22	9 46.13		9 54.61	54.25	9 53.97	52.99	9 54.01	54.09
	50.39		51.12				54.43		53.48		54.05	
+66	21 51	22 48									21 57	22 42
	2.11663	2.11693									2.11663	2.11690
	+1085		+992		+1710		−638		−551		−835	
	2.12748	2.12778	2.12655	2.12685	2.13378	2.13403	2.11025	2.11055	2.11112	2.11142	2.10828	2.10855
	−134.12	−134.21	−133.83	−133.92	−136.06	−136.16	−128.90	−128.99	−129.16	−129.25	−128.32	−128.40
	− .02	− .02	− .01	− .01	− .01	− .01	− .02	− .02	− .02	− .02	− .02	− .02
	+.13 +.06	+.09	+.09 +.01	+.04	+ 0	~~−10~~ −.21	+.11 −.12	+.06	+.08 +.08	+.09	+.10 +.07	+.04
	−.04	−.06	−.04	−.06	−.21		−.18	−.24	.00	.00	.00	.00
	−2 14.05	−2 14.20	−2 ~~34.79~~ 13.79	−2 13.95	−2 16.28		−2 8.99	−2 9.19	−2 9.08 78	−2 9.18	−2 8.24	−2 8.38
−24	12 4.50	4.53	12 3.81	6.17	12 2.41		12 3.60	3.44	12 3.07	2.17	12 2.25	2.47
	+10 19.51	17.60	+ 19.87	17.92	+ 16.67	14.71	+ 16.01	14.00	+ 15.31	13.32	+16.63	14.67
	− 1.91	−6.27	− 1.95	−6.10	− 1.96	−6.04	− 2.01	5.54	− 1.99	5.49	− 1.96	5.48
	+13.84		+14.01		+14.07		+14.57		+14.62		+14.63	
	+10 31.44	1 33.06	+ 31.93	31.88	+ 28.78		+ 28.57	35.03	+ 27.94	35.13	+ 29.30	32.95
		33.09		34.24				34.87		34.23		33.17
	1 33.07		33.06		33.63		34.95		34.68		33.06	
	1 53.18		53.17		53.74		55.06		54.79		53.17	

1875
α 1 58.14
δ 1 53.82
dα/dT +3.081
dδ/dT -20.11

l cos δ 9.96062
l c .12552
l c′ .08614

1875

	May 5				May 13				May 27		
	-.513				-.310				-.510		
1	45.5	1	35.9	1	44.2	1	34.4	1	42.5	1	40.0
	47.7		38.0		46.5		36.2		44.7		41.9
	50.0		39.4		48.7		38.4		47.0		43.8
	54.6				53.2				51.5		
	56.8				55.5				53.6		
	59.0				57.7				56.0		
	1.2	2	16.0		0.1	2	18.5		58.2	2	20.6
	3.5		18.7		2.3		20.7		0.5		23.0
	8.0		20.6		6.9		22.2		5.0		25.3
	10.4				9.1				7.2		
	12.6				11.3				9.4		
	3493				3355				3756		
	300				300				240		
	6493	1	37.77		6335	1	36.33		6756	1	41.90
1	59.027	2	18.60	1	57.713	2	20.30	2	~~61.418~~	2	22.97
								1	55.964		
	59.010				57.756				55.947		
+	0.44			+	1.58			+	3.29		
+	23			+	.14			+	.23		
-	1.41			-	1.36			-	1.24		
-	0.74			+	0.36			+	2.28		
1	59.01			1	57.76			1	55.95		
1	58.27			1	58.12			1	58.23		
									58.207		
	S										
	+21.26		-19.57		+21.44		-22.53		+14.06		-27.01
5				5				5			
1	-2.70				-2.38				-2.07		
1	7.2	1	57.1	1	7.8	2	1.5	1	17.6	2	9.3
	15.8		5.4		20.0		14.0		39.1		28.9
	23.0		12.25		27.8		13.5		56.7		38.2
6	11.50	7	1.25	6	13.90	7	7.75	6	28.35	7	19.10
	1.32756		1.29159n		1.33122		1.35276n		1.14799		1.43152n
	1.41370		1.38773n		1.41736		1.43890n		1.23418		1.51766n
	+25.93		-24.42		+26.14		-27.47		+17.15		-32.93
6	37.43	6	36.83	6	40.04	6	40.28	6	45.50	6	46.17
43	49.08		48.48	43	51.69		51.93	43	57.15		57.82
	48.78				51.81				57.48		
22	23	23	13					22	40	23	31
	2.11680		2.11707						2.11690		2.11717
	+182				+101				-979		
	2.11862		2.11889		2.11781		2.11808		2.10711		2.10738
	-131.41		-131.49		-131.16		-131.25		-127.97		-128.05
	- .01		- .01		- .01		- .01		- 2		- 2
	+.08	-.08	+.07		+.08	-.06	+.09		+.04	-.08	+.14
	-12		-20		-11		-19		-13		-21
-2	11.46	-2	11.63	-2	11.20	-2	11.36	-2	8.08	-2	8.14
46	0.54		0.11	46	2.89		3.29	46	5.23		5.96
-16	7.46		9.94	-	5.90		8.08	-	4.01		5.91
-	2.48			-	2.18			-	1.90		
	+16.75				+16.22				+16.69		
-15	54.19	1	54.73	-	51.86		54.75	-	49.22		54.45
			54.20				55.15				55.18
1	54.47				54.95				54.82		

1874 1875

ε Corvi.

h m sec
12 3 42

−21° 55′

ζ = +64° 18′

ζ sin ζ = +.90

	1874	1875
α		3 41.96
δ		55 29.16
dα/dτ		+ 3.076
dδ/dτ		− 20.04
l cos δ	9.96742	9.96742
l c	.10992	.12552
l c′	.07734	.09294
l sin δ	9.57201n	

cos α =
cos δ =
tan δ = −.40
I = 2.22 s
K = −.017 s

	1874						1874		1875			
	May 10		May 11		May 27		May 28		May 5		May 13	
	−.199		−.155		−.283		−.297		−.513		−.310	
12	2 44.9	2 41.6	2 44.1	2 26.5	2 34.6	2 31.0	2 34.3	2 27.7	3 29.6	3 20.4	3 28.1	3 17.3
	47.2	42.7	46.3	29.1	36.8	32.7	36.5	30.1	31.8	22.2	30.3	19.0
	49.3		48.5	30.6	39.0	34.2	38.6	32.3	34.0	24.0	32.7	21.0
	53.9		53.0		43.4		43.2		38.5		35.0	
	56.1		55.1		45.7		45.4		40.6		39.2	
	58.3		57.4		48.0		47.6		42.8		41.6	
	0.6	3 30.0	59.5	3 10.0	50.1	3 6.7	49.8	3 3.3	45.0	4 0.7	43.8	4 8.2
	2.6	31.8	1.7	11.8	52.4	8.9	52.2	5.0	47.4		46.0	10.4
	7.2	33.2	6.3	13.5	56.9	11.4	56.5	6.8	51.8		50.4	12.8
	9.4		8.6		59.1		58.8		54.0		52.7	
	11.6		10.6		1.4		1.0		56.3		55.0	
	3411		3911		4674		4639		4718		4568	
	300		240		60		60					
	6411	2 42.15	6311	2 28.73	5274	2 32.63	5239	2 30.03		3 22.20		3 19.10
	2 58.282	3 31.67	2 57.373	3 11.77	2 47.945	3 9.00	2 47.627	3 5.03	3 42.891	4 0.70	3 41.527	4 10.47
	58.265		57.356		47.928		47.610		42.874		41.510	
	+ 41.52		+ 42.44		+ 51.68		+ 52.06		+ 0.44		+ 1.58	
	+ .08		+ .06		+ .11		+ .12		+ .20		+ .12	
	− 1.11	+1.966	− 1.11	+1.966	− 0.97	+2.106	− 0.96	+2.116	− 1.43		− 1.38	
	+ 40.49		+ 41.42		+ 50.82		+ 51.22		− 0.79		+ 0.32	
	2 58.26		2 57.36		2 47.93		2 47.61		3 42.81		3 41.51	
	3 38.75		3 38.78		3 38.75		3 38.83		3 42.08		3 41.83	
	41.826		41.856		41.826			41.906				
							38.778					
	+16.13	−33.39	+28.64	−14.40	+15.31	−21.06	+17.60	−17.40	+20.69	−17.81	+22.43	4 −28.95
	25		25		25		25		55		55	
	−2.43		−2.14		−2.17		−2.14		−2.70		−2.38	
	0 59.9	1 57.3	0 39.6	1 30.0	0 1.0	1 44.9	0 58.0	1 40.0	4 53.1	0 41.8	4 50.8	0 55.5
	17.0	14.9	57.5	47.9	17.2	2.4	17.0	59.4	1.9	50.9	5.2	9.7
	1369	1322	971	779	182	1073	1350	994	1150	927	1160	1252
	26 8.45	27 6.10	25 48.55	26 38.95	25 9.10	26 53.65	26 7.50	26 49.70	59 57.50	0 46.35	59 58.00	1 2.60
	1.20763	1.52362n	1.45697	1.15836n	1.18498	1.32346n	1.24551	1.24055n	1.31576	1.25066n	1.35083	1.46165n
	1.28497	1.60096n	1.53431	1.23570n	1.26232	1.40080n	1.32285	1.31789n	1.40870	1.34360n	1.44377	1.55459n
	+19.27	−39.90	+34.22	−17.21	+18.30	−25.17	+21.03	−20.79	+25.63	− 22.06	+27.78	−35.86
	26 27.72	26 26.20	26 22.77	26 21.74	26 27.40	26 28.48	26 28.53	26 28.91	0 23.15	0 24.29	0 25.78	0 26.74
	3 39.37	37.85	3 34.42	33.39	3 39.05	40.13	3 40.18	40.56	37 34.78	35.94	37 37.43	38.39
	38.61		33.40		34.59		40.37		35.36		37.91	
+64	15 51	16 49					15 50	16 33	16 9	16 58	16 10	17 15
	2.07506	2.07538					2.07506	2.07531	2.07518	2.07544	2.07518	2.07554
	+992		+1718		−546		−830		+190		+106	
	2.08498	2.08530	2.09224	2.09256	2.06960	2.06992	2.06676	2.06701	2.07708	2.07734	2.07624	2.07660
	−121.61	−121.70	−123.66	−123.76	−117.38	−117.47	−116.62	−116.69	−119.42	−119.49	−119.19	−119.29
	− .01	− 1	− 1	− 1	− 2	− 2	− 1	− 1	− 1	− 1	− 1	− 1
	+.04	+.09 +.21	+.15	.06 +.03	+.04	+.06 +.08	+.06	+.05 +.05	+.08	−.21 +.06	+.09	−.15 +.10
	−.02	−.04	−.06	−.13	.00	.00	.00	.00	−.49	−.08	−.45	−.09
	−2 1.60	−2 1.54	−2 3.58	−2 3.87	−1 57.36	−1 57.41	−1 56.57	−1 56.65	−1 59.84	−1 59.52	−1 59.56	−1 59.24
−22	5 40.97	39.39	5 38.00	37.26	5 36.41	37.54	5 37.75	37.21	39 34.62	35.46	39 36.99	37.63
	+10 19.87	17.95	+ 16.67	14.74	+ 15.31	12.36	+ 16.63	14.70	−16 7.46	9.89	−5.90	8.04
	− 1.92	−6.46	− 1.93	−6.42	− 1.95	−5.98	− 1.93	−5.97	− 2.43		− 2.14	
	+13.58		+13.62		+14.06		+14.07		+15.36		+15.78	
	+10 31.53	55 9.44	+ 28.36	9.64	+ 27.42	8.99	+ 28.77	7.98	−15 54.53	29.15	− 52.26	29.25
		7.86		8.90		10.12		8.44		29.99		29.89
	55 8.65		9.27		9.55		8.21		55 29.57		29.57	
	55 28.69		29.31		29.59		28.25					

1875

June 1

-500.
3 27.2 3 20.2
29.3 22.0
31.6 23.7
36.0
38.2
40.4
42.6
45.0
49.3
51.6
53.8

4450 3 2197
3 40455

40.438

+ 2.38
+ .20
− 1.21
+ 1.37
3 40.44

3 41.81

41.907

+18.48
55

1 −20.4
4 51.8
9.3
1 12.1.1
0 0.55

1.26670
1.35964
22.89
0 23.44

37 35.09

+502
2.08008 2.08040
−120.25
0
−.06 ~~-03~~
00 −.06
−2 0.31
39 35.40
−16 6.20 8.04
− 1.84
+16.16
−15 51.88

55 27.28

4. H. Draconis)
12^h 6^m $19^{sec.}$
$+78^\circ$ $19'$
z = -35° $56'$
δ sin z = −.59

1874
May 10 6^m $23^s.20$ 18′ 70″.2
15 22.83 −.37 71.1 +.9
20 22.43 .40 71.8 .7
25 22.02 .41 72.4 .6
30 21.58 .44 72.9 .5

1874
α $16^s.281$
δ +18′ 59″.35
dα/dt $+2^s.904$
dδ/dt −20″.834

l cos δ 9.30643
l b .10992
l b′ 9.41635

l sin δ 9.99091

9.29734
6.73672
6.03406

corr α = −.029
corr δ =

tang δ = ~~4.84~~ 4.94
I = $10^s.18$
k = −.076

X 1874 −.11 May 7 −.105 | X −.20 May 10 −.199 | X −.18 May 11 −.155 | X −.15 −.04 May 13 −.164 | −.28 X May 24 ~~−.268~~ −.272 | X −.22 May 27 −.283

5 25.0 5 | 5 22.2 4 49.0 | 5 20.8 4 42.2 | 5 18.7 4 33.1 | 5 12.6 4 14.0 | 5 11.6 4 86.5
30.1 | 27.6 57.6 | 26.1 51.2 | 24.0 40.3 | 17.7 22.8 | 16.3 46.5
35.2 | 32.8 2 8.6 | 31.9 0.9 | 29.0 49.2 | 22.4 29.9 | 21.6 54.9
40.0 | 38.0 | 36.4 | 34.1 | 27.5 | 26.5
45.0 | 43.3 | 41.4 | 39.1 | 32.7 | 31.5
49.8 | 48.0 | 46.2 | 44.3 | 38.0 | 36.6
55.6 6 51.9 | 53.7 6 12.0 | 51.7 6 6.7 | 49.5 5 58.3 | 43.0 5 26.0 | 41.7 5 44.0
0.3 2.0 | 58.6 14.7 | 57.3 17.2 | 54.5 8.5 | 48.1 36.3 | 47.1 53.1
5.5 8.3 | 3.8 17.8 | 2.2 25.3 | 59.2 15.8 | 53.1 44.4 | 57.7 1.9

2865 | 3280 | 3140 | 3524 | 2951 | 2846
12.0 | 60 | 60
406.5 | 3880 4 58.40 | 3740 4 51.43 | 4 40.87 | 4 22.23 | 4 45.97
5 .45.167 7 0.73 | 5 43.111 6 14.83 | 5 ~~41.567~~ 6 16.40 | 5 39.156 6 7.53 | 5 32.789 5 35.57 | 5 31.622 5 53.00
41.556

45.091 +38.85 | 43.035 +41.53 | 41.480 +42.48 | 39.080 +44.71 | 32.713 +50.56 | 31.546 +51.64
6 23.440 −.53 | 6 23.218 −.97 | 6 23.1510 −.87 | 6 22.96 −.73 | 6 ~~22.43~~ 209 −1.36 | 6 21.861 −1.06
−38.351 | −40.1915 | −41.5762 | −43.9288 −.20 | −~~50.21~~ 49.38 | −50.3126
−38.28 −7.12 | −40.12 −6.90 | −41.59 −6.82 | −43.85 −6.68 | −49.35 −5.81 | −50.23 −5.53
6 16.29 | 16.70 | 16.27 | 16.18 | 16.10 | 16.60
+ 38.84 | + 41.52 .70 | + 42.47 | + 44.64 | + 50.54 | + 51.68
− .51 | − .96 | − .75 | − .79 | − 1.32 | − 1.37
− 7.12 −4.216 | − 6.90 −3.996 | − 6.82 −3.916 | − 6.68 −3.776 | − 5.81 −2.906 | − 5.53 −2.626
+ 31.21 8 48.81 | + 33.66 48.75 | + 34.90 51.14 | + 37.17 48.65 | + 43.41 55.35 | + 44.78 55.81
5 45.09 +10 19.93 | 5 43.03 +10 19.85 | 5 41.48 +10 17.28 | 5 39.08 +10 22.55 | 5 37.71 +10 16.26 | 5 31.55 +10 15.68
+1.3 | +1.3 | +1.3 | +1.3 | +1.3 | +1.3
6 16.30 −10.40 | 6 16.69 −10.90 | 6 16.38 −11.10 | 6 16.25 −11.50 | 6 16.12 −13.00 | 6 16.33 −13.40
~~19.154~~ 78 18 59.64 | 19.394 18 59.00 | 19.284 18 58.62 | 19.154 18 9 1.00 | 19.024 18 59.91 | 19.234 18 59.39
19.204

−75.56 | +44.71 −31.72 | +50.14 −34.83 | +38.29 −26.37 | +70.56 −2.76 | +45.65 −21.38
10 | 10 | 10 | 10 | 10 | 10
−2.08 | −2.13 | −2.14 | −2.18 | −2.19 | −2.17

4 24.3 0 58.5 | 4 29.0 4 48.2 | 4 24.9 4 47.1 | 4 18.3 4 41.0 | 4 15.0 4 33.9 | 4 21.1 4 38.5
27.5 4.3 | 32.1 52.0 | 28.4 51.8 | 30.8 53.2 | 14.7 35.0 | 22.1 40.0
51.8 12.28 | 61.1 100.2 | 53.3 98.9 | 49.1 94.2 | 29.7 68.9 | 43.2 78.5
14 25.90 16 (15) 1.40 | 14 30.55 14 50.10 | 14 26.65 14 49.45 | 14 24.55 14 47.10 | 14 14.85 14 34.45 | 14 21.60 14 39.25

1.87829n 1.65040 1.50133n 1.70010 1.54208n 1.76559 1.~~42111~~n 45286 1.84856 0.44091n 1.65944 1.33001n
1.29464n 1.06645 0.91768n 1.11645 0.95843n 1.18194 0.~~83746~~n 86921 1.26491 9.85726n 1.07579 0.74636n
−19.71 +11.66 −8.27 +13.04 −9.09 +15.20 −7.28 +18.40 −0.74 +11.91 −5.58
14 41.69 14 42.21 14 41.83 14 39.42 14 40.36 14 39.75 14 ~~40.48~~ 39.70 14 33.25 14 ~~27.48~~ 33.71 14 33.51 14 33.67
8 6.66 6.14
+78° 8 6.14 6.52 8 8.63 7.99 8 8.60 ~~8.13~~ 8 15.10 8 ~~27.27~~ 8 14.84 14.68
6.33 8.31 8.62 8.65 14.87 8 14.64 14.76

−35 55 16 55 47 55 17
1.62010n 1.62020n 1.62010n
+ 1097 + 1097 + 998 + 998 + 1728 + 1728 − 1136 − 618 − 538
1.63117 1.63117 1.63008 1.63008 1.63848 1.63738 1.60884 1.60874 1.61402 1.61392 1.61482 1.61472
+42.77 +42.77 +42.67 +42.67 +43.40 +43.39 +40.63 +40.62 +41.12 +41.11 +41.19 +41.18

−.62 −.62 −.21 −.25 −.10 −.26 −.56 −.13 −.38 −.59 −.08 −.18 −.63 −0 −.21 −.13 −.05
−.09 .00 −.09 −.10 −.35 −.38 −.35 −.38 −.34 −.37 .00 .00
+42.15 +42.37 +42.47 +42.79 +42.88 +39.90 +40.16 +40.22 +40.74 +40.98 +41.13
8 48.81 48.81 48.51 48.99 51.42 50.87 48.50 48.29 81 8 55.32 8 55.88 55.82 55.81
19 9.97 10.2 10.4 10.8 12.3 12.8
+10 20.9 20.9 21.7 21.2 19.0 19.5 22.8 22.5 17.0 16.9 16.9 16.9
−10 20.9 21.5 1.93 22.4 1.70 1.69
+10 19.51 20.73 59.14 | + 19.87 21.12 58.73 | + 16.67 19.35 58.25 | + 22.17 23.45 60.45 | + 16.01 17.30 59.62 | + 15.31 16.59 59.01
+ 1.22 −30.43 59.14 | + 1.25 −30.93 59.21 | + 1.26 −31.13 57.70 | + 1.28 −31.53 60.76 | + 1.29 −33.03 59.68 | + 1.28 −33.43 59.00
− 10.40 | − 10.90 | − 11.10 | − 11.50 | − 13.00 | − 13.40
+10 10.33 18 59.14 | + 10.22 58.97 | + 6.83 57.97 | + 11.95 60.60 | + 4.30 59.65 | + 3.19 59.1
18 39.11 | 38.94 | 37.94 | 4057 ~~40.57~~ | 39.62 | 38.97

1875

May 10 6m 26s.83 | 17′ 108″.1
15 26.45 -.38 | 109.0 +.9
20 26.05 .40 | 109.7 .7
25 25.63 .42 | 110.3 .6
30 25.20 .41 | 110.7 .4

1875.5
α 19s.184
δ +18 39″.32
dα/dT +2.903
dδ/dT -20.034

l cos δ 9.30643
l b .12552
l b′ 9.43195

1874.0 α	δ	1875.0 α	δ
16.25		19.23	
09		09	
38		19	
25		06	
12			
33			
38			
16.343		19.143	
.281	59.35	.184	39.32
+.062		-.041	

~~1874~~ 1874 | 1875

-.31 May 28 -.294 | -.37 -.20 May 5 -.318 | -.32 May 12 -.320 | -.32 May 13 -.310 | -.52 May 27 -.610

12 5 10.8 4 37.5 6 | 5 17.1 6 | 5 6.1 6 | 5 19.0 6 | 4 57.8
16.1 47.1 | 9.2 26.5 | 6.4 18.4 | 6.3 28.2 | 4.6 5.9
20.9 56.8 | 14.0 34.6 | 11.7 23.8 | 11.3 37.2 | 9.4 14.3
26.4 | 19.0 | 16.4 | 16.4 | 14.2
31.0 | 24.2 | 21.5 | 21.4 | 19.3
36.5 | 29.2 | 26.4 | 26.8 | 24.6
41.4 5 37.0 | 34.4 6 19.8 | 31.8 6 58.5 | 31.8 6 34.6 | 29.7 6 50.7
46.6 48.5 | 39.9 30.0 | 37.3 | 36.8 43.2 | 34.8
51.8 54.7 | 44.4 39.7 | 42.1 | 41.2 54.8 | 39.4
| 49.7 | 47.1 | 47.2 | 45.2
28.15 4 47.13 | 26.40 5 26.07 | 24.07 5 14.43 | 23.92 5 28.13 | 22.12 5 6.00
5 31.278 5 46.73 | 6 ~~28.556~~ 24.333 6 29.83 | 6 26.744 6 58.50 | 6 26.578 6 44.20 | 6 24.578 6 50.70

31.202 | 29.257 | 26.668 | 26.502 | 24.502
6 21.782 +52.11 | 6 27.237 +0.63 | 6 ~~26.70~~65 +1.46 | 6 26.6257 +1.61 | 6 25.484 +3.32
-50.582 -1.50 | +2.039 -1.79 | ~~-6.03~~ +0.02 -1.55 | -0.1207 -1.55 | -0.994 -2.52
-50.49 | +2.12 -.99 | +0.05 | -0.04 | -0.91
-5.44 | -7.99 | -7.47 | -7.39 | -6.26
+ 53.06 6 16.37 | + 0.44 19.12 | + 1.44 19.11 | + 1.58 19.17 | + 3.29 19~~10~~.04
- 1.44 | - 2.48 | - 1.55 | - 1.50 | - 2.47 .04
- 5.44 -2.536 | - 7.99 | - 7.47 | - 7.359 | - 6.26
+ 45.18 | - 10.03 | - 7.58 | - 7.31 | - 5.44
5 31.20 8 55.00 | 6 29.26 34 52.88 | 6 26.67 53.39 | 6 26.50 53.19 | 6 24.50 53.23
+10 17.05 | -16 7.09 | -16 5.93 | -16 5.46 | -16 3.59
6 16.38 +12 | 6 19.23 +1.5 | 6 19.09 +14 | 6 19.19 +14 | 6 19.06 +12
19.284 -13.50 | -7.80 | -9.20 | -9.40 | -11.20
18 59.75 | 18 39.49 | 18 39.66 | 18 39.73 | 18 39.64

+78

+44.15 -15.45 | +63.26 -0.50 | +72.31 -31.76 | +58.45 -17.62 | +78.58 -26.12
10 45 | 45 | 45 | 45
-2.14 | -2.70 | -2.41 | -2.38 | -2.07
4 20.9 4 34.9 | 3 12.3 3 30.1 | 3 7.7 3 34.9 | 3 12.2 3 32.4 | 3 1.5 3 30.0
25.9 39.9 | 26.7 44.1 | 25.2 52.6 | 29.3 49.8 | 28.3 56.5
68 74.8 | 39.0 74.2 | 32.9 87.5 | 41.5 82.2 | 29.8 86.5
14 23.40 14 37.40 | 48 19.50 48 37.10 | 48 16.45 48 43.75 | 48 20.75 48 41.10 | 48 14.90 48 43.25

1.64493 1.18893n | 1.80113 9.69897n | 1.85920 1.50188n | 1.76678 1.24601n | 1.89531 1.41697n
1.06128 0.60528n | 1.23308 9.13092n | 1.29115 0.93383n | 1.19843 0.67796n | 1.32726 0.84892n
+11.52 -4.03 | +17.10 -0.13 | +9.55 -8.59 | +15.80 -4.76 | +21.24 -7.06
14 34.52 14 33.37 | 48 36.60 48 36.97 | 48 36.10 48 35.16 | 48 36.55 48 36.34 | 48 36.14 48 36.19

8 13.43 8 14.98 | 34 11.75 11.38 | 34 12.35 13.19 | 34 11.80 12.01 | 34 12.21 12.16
14.20 | 11.56 | 12.77 | 11.90 | 12.18
55 54 55 40 | 55 29 55 11 | | | 55 33 55 5
1.62020n 1.62010n | 1.62010n 1.62000n | | | 1.62010n 1.62000n
-824 1.61186 | +200 | -421 | +114 | -951
1.61196 | 1.62210 1.62200 | 1.61589 1.61579 | 1.62124 1.62114 | 1.61059 1.61049
+40.92 +40.91 | +41.89 +41.88 | +41.29 +41.28 | +41.81 +41.80 | +41.74 +41.73

-.21 -.12 -.02 | -.44 -.56 -0 | -.59 -.66 -.10 | -.38 -.52 -.03 | -.68 -.68 -.07
00 00 | -.33 -.36 | -.30 -.33 | -.30 -.33 | -.29 -.33
+40.71 +40.89 | +41.12 +41.52 | +40.40 +40.85 | +41.13 +41.44 | +40.77 +41.33
8 54.04 55.87 | 34 52.87 52.90 | 52.75 54.04 | 52.93 53.45 | 52.98 53.47
19 12.8 | 18 47.1 | 48.5 | 48.7 | 50.5
+10 18.7 16.5 | -16 5.8 5.8 | 4.2 5.5 | 4.2 4.7 | 2.5 3.0
+10 17.8 | -16 5.8 | 4.8 | 4.5 | 2.7
+10 16.63 17.89 58.53 | -16 7.46 5.87 39.20 | - 6.48 5.06 38.49 | - 5.90 4.50 39.03 | - 4.01 2.79 38.99
+ 1.26 33.53 60.26 | + 1.59 39.23 | + 1.42 39.78 | + 1.40 39.55 | + 1.22 39.50
- 13.50 | - 7.80 | - 9.20 | - 9.40 | - 11.20
+10 4.39 18 59.40 | -16 13.67 18 39.21 | - 14.26 39.13 | - 13.90 39.29 | - 13.99 39.25
18 39.37

8

32

1874

γ Corvi

h	m	sec.
12	9	22

− 16° 50′

γ = + 59° 13′

γ sin z = +.86

α
δ
$\frac{22}{27}$
$\frac{28}{27}$

l cos δ 9.98098
l c .10992
l c′ .09090

l sin δ 9.46178n

cons =
cons δ =

lag δ = −.30
I = 2.15 s
k = −.016 s

1874

May 10		May 11		May 13		May 24		May 27		May 28	
−.199		−.155		−.164		~~−.268~~ −.272		−.283		−.297	
8 26.3	8 22.9	8 25.4	8 11.2	8 23.2	8 19.7	8 —	8 39.5	8 16.1	8 12.3	8 15.7	8 17.0
28.4	24.6	27.6	13.1	25.6	21.8	—	43.3	18.2	14.5	17.8	19.2
30.7	26.7	29.6	15.1	27.5	24.3	—		20.3	16.4	19.9	21.3
35.0		34.0		31.9		—		24.7		24.3	
37.0		36.2		34.3		30.35 28.2		26.8		26.4	
39.3		38.3		36.3		10 30.1		29.0		28.5	
41.4	9 3.8	40.5	9 4.7	38.2	8 57.8	05 32.2	9 12.1	31.1	8 57.5	30.7	8 58.2
43.5	6.0	42.6	6.8	40.5	59.8	00 34.3		33.2	53.5	32.8	0.2
47.8	7.5	47.0	8.7	44.7	2.0	20 38.6		37.5	53.8	37.3	2.7
48.9		49.1		46.9		15 40.9		39.7		39.3	
52.1		51.2		49.1		10 43.0		41.9		41.4	
431.4	8 24.73	421.5	8 13.13	398.2	8 21.93	[illegible]	8 41.40	318.5	8 14.40	314.1	8 19.17
8 39.218	9 5.77	8 38.318	9 6.73	8 36.200	8 59.87	8 30.107	9 12.10	8 28.955	8 53.60	8 28.555	9 0.37
39.202		38.302		36.184		30.091		28.939		28.539	

May 10	May 11	May 13	May 24	May 27	May 28
+ 41.52	+ 42.47	+ 44.64	+ 50.54	+ 51.68	+ 52.06
+ .06	+ .05	+ .05	+ .08	+ .08	+ .09
− 1.17 +1.907	− 1.16 +1.917	− 1.15 +1.927	− 1.06 +2.017	− 1.04 +2.037	− 1.03 +2.047
+ 40.41	+ 41.36	+ 43.54	+ 49.56	+ 50.72	+ 51.~~09~~12
8 39.20	8 38.30	8 36.18	8 30.09	8 28.94	8 28.54
9 19.61	9 19.66	9 19.72	9 19.65	9 19.66	9 19.6~~5~~6
22.687	22.737	22.797	22.727	22.737	22.737
					19.639

						11.29	42.99				
20 +14.49	−26.55	20 +25.19	−28.41	20 +14.27	−23.67	20 −~~6.07~~	−~~36.77~~	20 +14.55	−24.65	20 +9.38	−31.82
−2.18		−2.14		−2.18		−2.19		−2.17		−2.14	
1 44.0	2 33.9	1 28.0	2 32.3	1 47.8	2 35.2	2 19.0	2 57.1	1 46.3	2 34.9	1 50.2	2 42.7
1.1	50.8	44.7	51.0	14.5	1.9	34.8	11.0	3.1	51.0	10.5	58.1
105.1n	84.7	72.7	83.3	122.3	97.1	53.8	128.1	109.4	85.9	120.7	110.8
21 52.55	22 42.35	21 36.35	22 41.65	22 1.15	22 48.55	22 26.90	23 4.05	21 54.70	22 42.95	22 0.35	22 50.40
1.16107	1.42406	1.40123	1.45347n	1.15442	1.37420n	1.05269n	1.63337n	1.16286	1.39182n	1.07220	1.50270n
1.25197	1.51496n	1.49213	1.54437n	1.24532	1.46510n	1.14359n	1.72427n	1.25376	1.48272n	1.06310	1.59360n
+17.86	−32.73	+31.06	−35.02	+17.59	−29.18	−13.92	−53.00	+17.94	−30.39	+11.56	−39.23
22 14.41	22 9.62	22 7.41	22 6.63	22 18.74	22 19.37	22 12.98	22 11.05	22 12.64	22 12.56	22 11.91	22 11.17

−16°	59′ 22.06″	21.27	59 19.06	18.28	59 30.39	31.02	59 24.63	22.70	59 24.29	24.21	59 23.56	27.82
	21.66		18.67		30.70		23.66		24.25		23.19	
+59	11 35	12 25									11 43	12 33
	1.98345	1.98368									1.98348	1.98371
	+1006		+1744		−1124		−597		−526		−814	
	1.99351	1.99374	2.00089	2.00112	1.97221	1.97244	1.97748	1.97771	1.97819	1.97842	1.97534	1.97557
	−98.52	−98.57	−100.20	−100.26	−93.80	−93.85	−94.95	−95.00	−95.10	−95.15	−94.48	−94.53
	0	0	0	0	− 1	− 1	− 1	− 1	− 1	− 1	− 1	− 1
	+.03 +.02	+.10	+.09 −.07	+.12	+.03 −.13	+.08	+ 1 −.12	+.20	+.03 +.06	+.09	+ 1 +.08	+.15
	−.04	−.05	−.13	−.22	−.16	−.22	−.19	−.25	.00	.00	.00	.00
	−1 38.53	−1 38.52	−1 40.24	−1 40.36	−1 38.94	−1 34.00	−1 35.74	−1 35.06	−1 35.08	−1 34.07 35.07	−1 34.48	−1 34.39
−17	1 0.59	59.79	0 59.30	58.64	1 4.33	5.02	1 ~~6.20~~ 5.97	~~5.43~~	0 59.37	59.28	0 58.04	57.21
	+10 19.87	18.04	+ 16.67	14.83	+ 22.17	20.30	+ 16.01	14.13 57.76	+15.31	13.45	+ 16.63	14.79
	− 1.83	−7.48	− 1.84	−7.46	− 1.87	−7.41	− 1.88	−7.29	− 1.86	−7.29	− 1.84	−7.29
	+12.53		+12.55		+12.60		+12.72		+12.72		+12.72	
	+10 30.57	50 30.02	+ 27.38	31.92	+ 32.90	31.43	+ 26.85	32.92 ~~39.38~~	+ 26.17	33.20	+ 27.51	30.53
		29.22		31.26		32.12		30.91 ~~38.58~~		33.11		27.70
	50 29.62		31.59		31.78		~~38.76~~		33.15		30.12	
	50 49.63		~~51.45~~ 51.60		51.79		~~58.97~~ 31.91 51.92		53.16		50.13	

1875

9	22.86
50	50.55
	+ 3.077
	− 20.07

l cos δ 9.98098
l.6 .12552
l.6' .10650

1875

	May 5				May 13				May 27				June 1		
	−.313				−.310				−.510				−.500		
9	10.8	9	11.5	9	9.7	9	3.1	9	7.8	8	58.8	9	8.5	8	54.8
	13.0				11.8		5.8		10.0		0.9		10.7		56.9
	15.1				14.0		7.6		12.1		2.4		12.9		59.0
	19.3				18.3				16.5				17.1		
	21.6	9	54.9		20.4				18.6				19.4		
	23.8		57.6		22.6				20.6				21.5		
	26.0		0.5		24.7	9	43.5		22.8	9	32.3		23.6	9	34.8
	28.1				26.9		45.6		25.0		34.1		25.8		36.7
	32.5				31.1		47.9		29.3		37.0		30.1		38.0
	34.5				33.3				31.5				32.3		
	36.8				35.5				33.7				34.4		
	2615	9	11.50		2483	9	5.50		2279	8	0.70		2363	8	56.90
9	23.773	9	57.67	9	22.573	9	45.67	9	20.718	9	34.47	9	21.482	9	36.50
	23.757				22.557				20.702				21.466		
+	0.44			+	1.58			+	3.29			+	2.38		
+	.15			+	.09			+	.15			+	.15		
−	1.49			−	1.44			−	1.34			−	1.29		
−	0.80			+	0.23			+	2.10			+	1.24		
9	23.76			9	22.56			9	20.70			9	21.47		
9	22.86			9	22.79			9	22.80			9	22.71		
													22.815		
	+12.27		−33.90		+17.07		−23.10		+20.02		−13.75		+24.58		−15.02
55				55				55				55			
	−270				−238				−207				−204		
0	47.7	1	46.5	0	41.0	1	32.2	0	38.7	1	21.0	0	29.0	1	19.5
	58.0		54.8		54.9		45.5		59.9		42.5		47.7		38.2
	1057		1013		959		777		986		635		767		577
55	52.85	56	50.65	55	47.95	56	38.85	55	49.30	56	31.75	55	38.35	56	28.85
	[illegible]		1.53020n		1.23223		1.36361n		1.30146		1.13830n		1.39058		1.17667n
	[illegible]534		1.63670n		1.33873		1.47011n		1.40796		1.24480n		1.49708		1.28317n
	+15.68		−43.32		+21.81		−29.52		+25.58		−17.57		+31.41		−19.19
56	8.53	56	7.33	56	9.76	56	8.37	56	14.88	56	14.18	56	9.76	56	9.66
33	20.18		18.98	33	21.41		20.02	33	25.53		25.83	33	21.41		21.31
	19.58				20.71				25.68				21.36		
12	5	13	3									11	50	12	41
	1.98360		1.98385										1.98351		1.98377
	+218				+125				−926				+502		
	1.98578		1.98603		1.98485		1.98510		1.97434		1.97459		1.98853		1.98879
	−96.78		−96.83		−96.57		−96.63		−96.46		−96.51		−97.39		−97.45
	0		0		0		0		−1		−1		0		0
	+.02	−.04	+.16		+.04	−.04	+.08		+.06	−.05	+.03		+.09	−.08	+.03
	−.09		−.18		−.07		−.14		−.07		−.13		−.08		−.21
−1	36.74	−1	36.85	−1	36.60	−1	36.69	−1	36.48	−1	36.62	−1	37.38	−1	37.87 63
	85														
34	57.03		55.83	34	58.01		56.71	35	2.01		2.45	33	58.79		58.94
−16	7.46		9.78	−	5.90		7.94	−	4.01		5.79	−	6.20		7.95
−	2.32			−	2.04			−	1.78			−	1.75		
	+14.45				+14.72				+14.83				+14.81		
−15	55.33	50	52.36	−	53.22		51.23	−	50.96		52.97	−	53.14		51.93
			51.16				49.93				53.41				52.08
		50	51.76				50.58				53.19				52.01

22

η Virginis
h m sec.
12 13 31
+ 0° 2'
γ = +42° 21'
γ sin g = +.67

1874

Apr. 30	13m 28.90s		1'	52.0"	
May 5	28.88	−.02		52.2	+.2
10	28.85	.03		52.4	.2
15	28.82	.03		52.6	.2
20	28.79	.03		52.8	.2
25	28.76	.03		53.0	.2
30	28.72	.04		53.3	.3
June 4	28.68	.04		53.6	.3
9	28.63	.05		53.9	.3

1874.0
α 27.559
δ +2' 0.77
$\frac{d\alpha}{dt}$ +3.068s
$\frac{d\delta}{dt}$ −20.040"

l cos δ .00000
l c .10992
l c' .10992
l sin δ 6.76476

cons α =
cons δ =
l tang δ = +.00 1.00
I = 2.06°
K = −.015s

	× 1874		×		×		×		×		×	
	−.14		−.20		−.18		−.15 −.04		−.28		−.22	
	May 7		May 10		May 11		May 13		May 24		May 27	
	−.105		−.199		−.155		−.164		~~−.268~~ .272		−.283	
	12 37.9	12 27.7	12 35.0	12 26.7	12 34.1	12 21.7	12 31.8	12 23.1	12 25.8	12 16.3	12 24.8	12 15.0
	39.9	30.2	37.0	29.0	36.1	23.9	34.0	25.1	28.0	18.2	26.7	17.5
	42.0	32.0	39.1	30.6	38.2	25.5	36.0	26.5	30.0	19.8	28.8	19.5
	46.0		43.2		42.3		40.1		34.2		33.0	
	48.1		45.3		44.4		42.2		36.7		35.0	
	50.1		47.3		46.4		44.2		38.3		37.1	
	52.1	13 6.4	49.4	13 1.8	48.6	13 8.1	46.3	13 0.8	40.3	13 3.2	39.1	12 53.7
	54.2		51.4	3.8	50.6	9.8	48.3		42.4	5.0	41.3	55.9
	58.4		55.6	5.4	54.6	11.5	52.5		46.4	7.1	45.3	57.8
	0.3		57.6		56.7		54.5		48.5		47.3	
	2.5		59.7		58.7		56.5		50.5		49.4	
	4315		5206		5107		4864		4206		4078	
	120											17.33
	5515	12 29.97		12 28.77		12 23.70		12 24.90		12 18.10		12 ~~17.00~~
	12 50.136	13 6.40	12 47.327	13 3.67	12 46.427	13 9.80	12 44.218	13 0.80	12 38.236	13 5.10	12 37.073	12 35.80
	50.121	+38.85	47.312	+41.53	46.412	+42.48	44.203	+44.71	38.221	+50.56	37.058	+51.5764
	13 28.87	+.00	13 28.85	+.00	13 28.84	+.00	13 28.83	+.00	13 28.787	+.00	13 28.745	+.00
	−38.75		−41.51		−42.43		−44.63	−.04	−50.565		−51.689	
		−1.31		−1.29		−1.28		−1.27		−1.21		−1.19
	+ 38.85	13 27.66	+ 41.53	27.55	+ 42.48	27.61	+ 44.65	27.60	+ 50.554	27.57	+ 51.698	27.51
	− .00		− .08		− .00		− .08		− .00		− .00	
	− 1.31	+1.758	− 1.29	+1.778	− 1.28	+1.788	− 1.27	+1.798	− 1.21	+1.858	− 1.19	+1.878
	+ 37.54		+ 40.24		+ 41.20		+ 43.38		+ 49.33		+ 50.49	
	12 50.12	51 33.07	12 47.31	34.98	12 46.41	36.38	12 44.20	30.62	12 38.22	36.66	12 37.06	37.71
		+10 19.93		+10 19.85		+10 17.28		+10 22.55		+10 16.26		+10 15.68
	13 27.66	−1.5	13 27.55	−7.4	12 27.61	−7.5	13 27.58	−7.4	13 27.55	−1.4	13 27.55	−1.4
	30.728	+8.50	30.618	+8.40	30.678	+8.40	30.648	+8.30	30.618	+7.80	30.618	+7.70
	+0	2 0.00		2 1.83		2 0.54		2 0.07		1 59.32		1 59.69
											+19.74	
	+20.17	−16.26	+18.56	−16.34	+22.73	−23.37	+19.82	−16.58	+20.14	−26.86	~~+20.07~~	−18.73
	25		25		25		25		25		25	
	−208		−213		−214		−218		−219		−217	
	4 46.9	0 34.9	4 47.7	0 33.0	4 40.7	0 39.1	4 48.8	0 35.3	4 47.0	0 47.1	4 45.7	0 35.1
	2.8	51.1	3.3	48.9	55.5	55.1	14.7	0.6	1.1	1.1	1.1	50.0
	1097"	860	1110	819	962	942	1235	959	1081	1082	1068	831
	29 54.85	30 43.00	29 55.50	30 40.95	29 48.10	30 47.10	30 1.75	30 47.95	29 54.05	30 54.10	29 53.40	30 42.55
	1.30471	1.21112n	1.26858	1.21325n	1.35660	1.36866n	1.28601	1.21958n	1.30406	1.42911n	1.30255	1.27254n
	1.41463	1.32104n	1.37850	1.32317n	1.46652	1.47858n	1.39593	1.32950n	1.41398	1.53903n	1.41247	1.38246n
	+25.98	−20.94	+23.91	−21.04	+29.28	−30.10	+24.88	−21.36	+25.94	−34.60	+25.85	−24.12
	30 20.83	30 22.06	30 19.41	30 19.91	30 17.38	30 17.00	30 26.63	30 26.59	30 19.99	30 19.50	30 19.25	30 18.43
× δ°	52' 27.52"	26.29	52 28.94	28.44	52 30.97	31.35	52 21.72	21.76	52 28.36	28.85	52 29.10	29.92
	26.90		28.69		31.16		21.74		28.60		29.51	
+42	19 38	20 26									19 36	20 25
	1.71930	1.71950									1.71930	1.71950
	+1119		+1016		+1761		−1110		−582		−512	
	1.73069	1.73069	1.72946	1.72966	1.73691	1.73711	1.70820	1.70840	1.71348	1.71368	1.71418	1.71438
	−53.76	−53.79	−53.64	−53.66	−54.57	−54.59	−51.07	−51.10	−51.70	−51.72	−51.78	−51.81
	−.080 −.05	−.010	−.020 −.05	−.010	−.080 −.22	−.030	−.020 −.03	−.010	−.020 −.23	−.040	−.030 .00	−.02
	−.10	−.01	−.10	−.01	−.38	−.06	.00	−.06	−.39	−.07	.00	.00
	−53.86	−53.80	−53.74	−53.67	−54.95	−54.65	−51.07	−51.16	−52.09	−51.79	−51.78	−51.81
51	33.66	32.49	35.20	34.77	36.02	36.70	30.65	30.60	36.27	37.06	37.32	38.11
1	52.3		52.4		52.4		52.5		53.0		53.1	
+10	18.6	19.8	17.2	17.6	16.4	15.7	21.9	21.9	16.7	15.9	15.8	15.0
+10	19.2		17.4		16.0		21.9		16.3		15.4	
+10	19.51	2 0.28	+19.87	18.45 62.05	+16.87	15.24 59.66	+22.17	20.71 59.66	+16.01	14.55 58.62	+15.81	13.86 58.88
−	1.39	18.12 59.11	− 1.42	−11.64 61.62	− 1.43	−11.64 60.34	− 1.46	−11.74 59.61	− 1.46	−12.24 59.41	− 1.45	−12.34 59.67
+	8.50	−11.54	+ 8.40		+ 8.40		+ 8.30		+ 7.80		+ 7.70	
+10	26.62	1 59.69	+ 26.85	2 1.83	+ 23.64	0.00	+ 29.01	59.63	+ 22.35	59.02	+ 21.56	59.27
		39.65		41.79		39.96		39.59		38.98		39.23

1875s
30.627
+1' 40.73
+2.068
−20.040

8.00000
.12552
.12552

1875		h m s		° ' "	
Apr	30	13 32.28		1 30.3	
May	5	32.26	−.02	30.4	+.1
	10	32.23	.03	30.6	.2
	15	32.20	.03	30.8	.2
	20	32.17	.03	31.0	.2
	25	32.14	.03	31.2	.2
	30	32.10	.04	31.5	.3
June	4	32.06	.04	31.8	.3
	9	32.02	.04	32.1	.3

1874.0 α	δ	1875.0 α	δ
27.66		30.70	
55		61	
61		70	
58		73	
55		63	
55			
58			
27.583		30.674	
.559	0.77	.627	40.73
+.024		+.047	

1874		1875											
−.31		−.37 −.20		−.32		−.32		−.52		−.48			
May 28		May 5		May 12		May 13		May 27		June 1			
−.297		−.513		−.320		−.310		−.510		−.500			
12 12 —	—	13 19.5	13 11.8	13 18.3	13 12.0	13 18.4	13 6.5	13 16.6	13 7.0	13 17.4	13 7.0		
—	—	21.6	13.7	20.4	13.9	20.4	8.6	18.6	8.5	19.4	9.2		
—	—	23.7	15.8	22.5	16.4	22.5	10.3	20.7	10.5	21.6	11.0		
—		24.8		26.6		26.6		24.8		25.5			
36.76 34.7		29.9		28.8		28.7		26.9		27.6			
.80 36.8		31.9		30.8		30.8		29.0		29.8			
.74 38.8	12 46.6	34.0	13 49.1	32.9	13 46.0	32.8	13 56.0	31.0	13 45.0	31.8	13 56.8		
.78 40.9	48.4	36.0	51.0	34.9		34.8	57.8	33.1	47.0	33.8	58.7		
.76 45.0	51.0	40.1	53.3	39.0		38.9	59.3	37.2	49.0	38.0	0.7		
.70 47.0		42.2		41.1		41.0		39.3		40.0			
.64 49.0		44.3		43.2		43.0		41.2		42.0			
.58													
		3510		3385		3379		3184		3269			
			13 13.77		13 14.10		13 8.47		13 8.67		13 9.07		
36.720	12 48.67	13 31.909	13 51.13	13 30.773	13 46.00	13 30.718	13 57.70	13 28.945	13 47.00	13 29.718	13 58.73		
12 36.70	+52.11	31.894	+0.63	30.758	+1.46	30.703	+1.61	28.930	+3.32	29.703	+2.41		
13 28.74	+00	13 32.26	+00	13 32.22	+00	13 32.21	+00	13 32.12	+00	13 32.08	+00		
−52.04		−0.37	−.20	−1.46		−1.51		−3.19		−2.38			
	−1.18		−1.63		−1.59		−1.58		−1.49		−1.45		
+ 52.086	13 27.63	+ 0.44	30.69	+ 1.44	30.63	+ 1.58	30.~~64~~ .73	+ 3.29	30.76	+ 2.38	30.66		
− .00		− .00		− .00		− .00	.73	− .00		− .00			
− 1.18	+1.888	− 1.63		− 1.59		− 1.58		− 1.49		− 1.45			
+ 50.88		− 1.19		− 0.15		0.00		+ 1.80		+ 0.93			
12 36.70	51 3730	13 31.89	17 3775	13 30.76	3706	13 30.70	3710	13 28.93	3591	13 29.70	3918		
	+10 1705		−16 709		−16 593		−16 546		−16 359		−16 630		
13 27.58	−7.3	13 30.70	−1.8	13 30.61	−1.6	13 30.70	−1.6	13 30.73	−1.6	13 30.63	−1.5		
30.648	+760		+1030		+1000		+1000		+940		+910		
+0	2 065		1 3916		1 3953		1 4004		1 40.~~1~~ .12		4048		
−11.95		+ 18.14	−19.22	+ 16.67	−15.23	+ 22.25	−26.98	+ 20.27	−18.06	+ 20.65	−29.01		
30		0		0		0		0		0			
1 −2.44		{3} −2.70		−2.41		−2.38		−2.07		−2.04			
0 26.0		(?4) 49.1	4 38.7	3 49.2	4 33.5	3 42.7	4 48.2	3 43.8	4 35.1	3 39.2	4 44.9		
44.0		57.4	47.5	2.5	46.9	54.8	0.0	3.3	54.7	57.9	2.4		
70.0"		1065	862	1117	804	975	1082	1071	898	971	1073		
30 35.00		(3) 53.25	4 43.10	3 55.85	4 40.20	3 48.75	4 54.10	3 53.55	4 44.90	3 48.55	4 53.65		
1.07737n		1.25864	1.28375	1.22194	1.18270n	1.34733	1.43104n	1.30685	1.25672n	1.31492	1.46255n		
1.18729n		1.38416	1.40927	1.34746	1.30822n	1.47285	1.55656n	1.43237	1.38224n	1.44044	1.58807n		
−15.39		+24.22	−25.66	+22.25	−20.33	+29.71	−36.02	+27.06	−24.11	+27.57	−38.73		
30 19.61		4 17.47	4 17.44	4 18.10	4 19.87	4 18.46	4 18.08	4 20.61	4 20.79	4 16.12	4 14.92		
52 28.74		18 30.88	18 30.91	18 30.25	28.48	18 29.89	30.27	18 27.74	27.56	18 32.23	33.43		
		30.89		29.36		30.08		27.65		32.83			
		20 5	20 55							20 0	21 6		
		1.71940	1.71970.							1.71940	1.71970		
−803		+235		−421		+138		−898		+502			
1.71127	1.71147	1.72175	1.72205	1.71519	1.71549	1.72078	1.72108	1.71042	1.71072	1.72442	1.72472		
−51.44	~~−51.46~~	−52.69	−52.73	−51.90	−51.94	−52.57	−52.61	−51.34	−51.37	−53.02	5 −43.05		
−.080	~~.00~~ −.00	−.080 −.43	−.080	−.080 −.38	−.080	−.080 −.39	−.040	−.080 −.38	−.040	−.080 −.61	−.040		
.00		−.39	−.47	−.35	−.42	−.34	−.44	−.35	−.42	−.53	−.69		
−51.44		−53.08	−53.20	−52.25	−52.36	−52.91	−53.05	−51.69	−51.79	−53.55	−43.44		
51 37.30		17 37.80	37.71	38.00	36.12	36.98	37.22	36.05	35.77	38.68	39.69		
5.32		1 30.4		30.7		30.7		31.3		31.6			
+10 15.7		−16 7.4	7.5	7.3	5.4	6.3	6.5	4.7	4.5	7.1	8.1		
+10 15.9		−16 7.4		6.4		6.4		4.6		7.6			
+10 16.63	15.20	−16 7.46	9.26 38.84	− 6.48	8.09 39.91	− 5.90	7.49 39.49	− 4.61	6.39 40.06	− 6.20	7.56 40.22		
− 1.43	−12.44	− 1.80	38.75	− 1.61	38.03	− 1.59	39.73	− 1.38	39.78	− 1.36	41.23		
+ 7.60		+ 10.30		+ 10.00		+ 10.00		+ 9.40		+ 9.10			
+10 22.80	2 0.10	−15 58.96	1 38.78	− 58.09	38.97	− 57.49	39.61	− 55.99	39.92	− 58.46	40.72		
	1 40.06												

1874

12 Comae.

12h 16m 16sec.

+26° 33′

z = +15° 50′

sin z = +.27

log cos δ 9.95160

log b .10992

log b′ .06152

log sin δ 9.65029

cons α =

cons δ =

long δ = +.50s

I = 2.30s

K = −.07

1874

May 7		May 10		May 11		May 13		May 24		May 27	
−.105		−.199		−.155		−.164		~~−.268~~ .272		−.283	
15 19.2	15 8.3	15 16.6	15 8.2	15 15.6	15 1.9	15 13.5	15 2.8	15 7.5	14 56.0	15 6.3	15 0.4
21.6	10.3	18.8	10.5	17.8	3.3	15.7	5.1	9.9	58.3	8.5	2.8
23.9	12.7	21.4	11.7	20.2	5.2	18.0	6.9	12.2	59.9	10.9	5.0
28.5		25.8		24.7		22.6		16.7		15.5	
30.8		28.1		27.0		25.0		19.0		17.7	
33.1		30.4		29.4		27.2		21.3		20.1	
35.3		32.8	15 46.6	31.7	15 40.0	29.5	15 42.9	23.6	15 35.7	22.4	15 52.3
37.7		35.0	49.2	34.0	42.2	31.8	45.0	25.9	37.9	24.8	54.6
42.4		39.6	52.3	38.8	44.1	36.4	46.9	30.5	39.7	29.3	56.8
44.7		41.9		41.1		38.8		32.8		31.6	
46.9		44.2		43.2		41.1		35.2		33.8	
		6		5							
364.1	15 10.43	334.7	15 10.13	323.6	15 3.13	299.6	15 4.93	234.6	14 58.07	220.9	15 2.73
15 33.100		15 ~~30.427~~	15 49.37	15 ~~29.418~~	15 42.10	15 27.236	15 44.93	15 ~~29.509~~	15 37.77	15 20.082	15 54.57
		30.418		29.409				21.327			
33.083		30.401		29.392		27.219		21.310		20.065	
+ 38.85		+ 41.53		+ 42.48		+ 44.65		+ 50.55		+ 51.68	
− .05		− .10		− .08		− .08		− .12 4		− .14	
− 1.67 +1.355		− 1.65 +1.375		− 1.64 +1.385		− 1.62 +1.405		− 1.52 +1.505		− 1.49 +1.535	
+ 37.13		+ 39.78		+ 40.76 ′65		+ 42.95		+ 48.89		+ 50.05	
15 33.08		15 30.40		15 29.37 9		15 27.22		15 21.31		15 20.06	
16 10.21		16 10.18		16 10.08 15		16 10.17		16 10.20		16 10.11	
13.235		13.205		~~13.105~~ 13.175		13.195		13.225		13.135	
+22.67		+20.30 29	−19.94 18.95	+26.29 8	−12.68 9	+28.31 2	−17.69	~~+31.44~~ +23.26	~~−8.26~~ −16.44	+17.35	−34.49
55		55		55		55		55		55	
−2.08		−2.13		−2.14		−2.18		−2.19		−2.17	
4 37.0		4 37.8	0 24.9	4 30.1	0 14.2	4 35.5	0 21.0	4 32.1	0 16.9	4 38.2	0 37.1
46.9		48.5	35.9	41.2	25.9	55.0	42.3	40.1	27.3	47.8	48.3
83.9		86.3	60.8	71.3	40.1	90.5	63.3	72.2	44.2	86.0	85.4
59 41.95		59 43.15	0 30.40	59 35.65	0 20.05	59 45.25	0 31.65	59 36.10	0 22.10	59 43.00	0 42.70
1.35545		1.30728	1.27761n	1.41963	1.10312n	1.36754	1.24773n	1.36661	1.21590	1.23930	1.55769n
1.41697		1.36880	1.33913n	1.48115	1.16464n	1.42906	1.30925n	1.42813	1.27742n	1.30082	1.59921n
+26.12		+ 23.38	− 21.83	+ 30.28	−14.61	+ 26.86	−20.38	+ 26.80	−18.94	+19.99	−39.74
0 8.07		0 6.58	0 8.60	0 5.93	0 5.44	0 1.211	0 11.27	0 2.90	0 3.16	0 2.99	0 2.96
22 40.28	+26°	22′ 41.82″	39.75	22 42.42	42.91	22 36.24	37.08	22 45.45	45.19	22 45.36	45.39
		40.78		42.66		36.60		45.32		45.37	
	+15	49 26	58 13								
		1.21270	1.21310								
+11.25		+16.21		+17.71		−11.03		−5.71		−5.05	
1.22395		1.22291	1.22331	1.23041		1.20167	1.20207	1.20695	1.20735	1.20765	1.20805
−16.75		−16.71	−16.72	−17.00	−17.00	−15.91	−15.92	−16.10	−16.12	−16.13	−16.15
−.11	~~−.10~~	−.08 −.13	−.08	−.15 −.28	−.03	−.10 −.29	−.07	−.12 −.28	−.05	−.06 −.10	−.25
−.09	−.20	−.09	−.01	−.37	−.02	−.38	−.04	−.37	−.03	−.00	.00
−16.95		−16.88	−16.81	−17.52	17.05	−16.39	−16.03	−16.59	−16.20	−16.19	−16.40
+26 22 23.33		22 24.94	22.94	22 24.90	25.86	22 19.85	21.05	22 28.86	28.99	22 29.17	28.99
+10 19.51	18.95	+19.87	19.30	+16.67	16.10	+22.17	21.54	+16.01	15.42	+15.31	14.73
− .56	−18.18	− .57	−18.61	− .57	−18.75	− .58	−19.02	− .59	−20.40	− .58	−20.75
+1.83		+1.40		+1.26		+0.99		−0.39		−0.74	
+10 20.78		+ 20.70	45.64	+ 17.36	42.26	+ 22.58	42.43	+ 15.03	43.89	+ 13.99	43.16
			43.64		43.22		43.63		44.02		42.98
					42.74 ~~42.26~~						
32 44.17			44.69				43.03		43.95		43.07
32 24.10			24.63		22.73 ~~22.25~~		23.02		23.94		23.06

1875
α 16 13.25
δ 32 23.47
dα/dT + 3.025
dδ/dT − 20.01

l cos δ 9.95167
l b .12532
l b' .07712

1874		1875							
May 28		May 12		May 13		May 27		June 1	
−297		−320		−310		−510		−500	
12 15 6.0	14 55.5	16 0.0	15 51.2	16 0.0	15 52.6	15 58.2	15 47.8	15 59.0	15 57.7
8.2	57.6	2.2	53.3	2.2	55.2	16 0.6	50.5	16 1.2	59.3
10.6	0.0	4.7	55.5	4.5	57.3	2.8	52.3	3.6	1.4
15.1		9.3		9.1		7.4		8.0	
17.4		11.7		11.4		9.7		10.5	
19.7		13.9		13.8		12.0		12.7	
22.0	15 39.1	16.2	16 26.2	16.0	16 38.4	14.4	16 27.0	15.0	16 32.5
24.3	41.2	18.6	29.1	18.4	40.4	16.6	29.1	17.5	34.8
29.0	43.5	23.1	30.9	23.0	42.9	21.2	31.2	21.9	36.3
31.2		25.4		25.3		23.5		24.2	
33.5		27.6		27.6		25.9		26.6	
217.0	14 57.70	1527		1513		1923		2002	
15 19.727	15 41.27					60		60	
			15 53.33		15 55.03	1323	15 50.20	1402	15 57.47
		16 13.882	16 28.73	16 13.755	16 40.57	16 12.027	16 29.10	16 12.745	16 34.53
19.710		13.865		13.738		12.010		12.728	
+ 52.06		+ 1.44		+ 1.58		+ 3.29		+ 2.38	
− .15		− .16		− .15		− .25		− .25	
− 1.48 +1.545		− 1.99		− 1.98		− 1.85		− 1.80	
+ 50.43		− 0.71		− 0.55		+ 1.19		+ 0.33	
15 19.71		16 13.86		16 13.74		16 12.01		16 12.73	
16 10.14		16 13.18 5		16 13.19		16 13.20		16 13.06	
10.156	13.165							13.152	
55 +22.03	−21.54	30 +20.55	−14.85	30 +18.72	−26.82	30 +21.83	−17.07	30 +18.27 3	−21.79
1 −2.14		−2.41		−2.38		−2.07		−2.04	
4 31.9	0 21.3	3 30.1	4 12.5	3 33.8	4 28.4	3 27.1	4 13.1	3 34.0	4 15.9
43.7	35.2	47.5	29.4	49.9	44.8	51.2	37.9	55.2	37.9
75.6	56.5	77.6	41.9	83.7	73.2	78.3	51.0	89.2	53.8
59 37.80	0 28.25	33 38.80	34 20.95	33 41.85	34 36.60	33 39.15	34 25.50	33 44.60	34 26.90
1.34301	1.33325n	1.31281	1.17173n	1.27231	1.42846n	1.33905	1.28223n	13287 1.~~[illegible]~~	1.33826n
1.42013	1.41037n	1.38993	1.24885n	1.34943	1.50558n	1.41617	1.30935n	1.~~46896~~ 19949	1.41538n
+ 26.31	− 25.73	+ 24.54	− 17.74	+ 22.36	− 32.03	+ 26.07	− 20.89	~~+17.60~~ 5.85	− 26.02
0 4.11	0 2.52	34 3.34	34 3.21	34 4.21	34 4.57	34 5.22	34 4.11	~~33~~ 4 ~~59.25~~ 0.45	34 0.88
22 44.24 45.03	45.83	48 45.01 45.07	45.14	48 44.14 43.96	43.78	48 43.13 43.68	44.24	48 ~~49.10~~ 47.90 47.88	47.47
49 21	50 11	49 51	50 33					49 57	50 39
1.21270	1.21310	1.21300	1.21330					1.21300	1.21330
−797		−421		+146		−882		+502	
1.20473	1.20513	1.20879	1.20909	1.21446	1.21476	1.20418	1.20448	1.21802	1.21832
−16.02	−16.04	−16.17	−16.18	−16.38	−16.40	−16.00	−16.01	−16.52	−16.53
−10 −.09	−9	−09 −.42	−5	−8 −.48	−15	−9 −.43	−6	−3 −.63	−9
.00	.00	−32	−39	−33	−41	−32	−40	−52	−62
−16.12	−16.13	−16.58	−16.62	−16.79	−16.86	−16.41	−16.47	−17.07	−17.24
22 28.12	29.70	48 28.43	28.52	48 27.35	26.82	48 26.72	27.77	48 30.83	30.23
+10 16.63	16.06	−16 6.48	7.13	− 5.90	6.54	− 4.01	4.56	− 6.20	6.75
− .57	20.86	− .65		− .64		− .55		− .55	
−0.96 .85		+ 3.30		+ 3.17		+ 1.44		+ 0.91	
+10 15.21	43.33	−16 3.83	24.60	− 3.37	23.98	− 3.12	23.60	− 5.84	24.99
	44.91		24.69		23.45		24.65		24.39
	32 44.12		32 24.64		23.67		24.12		24.69
	32 24.11								

1874

13 Comae.

12h 18m 4sec

+26° 48′

~~φ = +44° 25′~~

φ = +15° 35′

sin z = +.27

l cos δ 9.95065

l 6 .10992

l 6′ .06057

l sin δ 9.65406

cos α =
cos δ =

tang δ = +.51

I = 2.31s

k = −.017s

1874

May 7		May 10		May 13		May 24		May 27		May 28	
−.105		−.199		~~.164~~		~~−.268~~ −.272		−.283		−.297	
17 —	17 —	17 5.6	16 56.1	17 11.6	1022 16 46.1	16 56.5	16 44.3	16 55.2	16 54.5	16 54.9	16 54.2
—	—	7.7	58.4	13.9	21 48.5	58.7	46.5	57.5		57.2	56.3
—	—	10.2	0.4	16.2	20 50.3	1.1	48.1	59.8		59.5	57.6
17.4		14.8		18.5	19	5.6		4.4		4.1	
19.7		17.0		20.8	18	8.0		6.8		6.4	
22.0		19.3		23.5	26	10.3		9.0		8.8	
24.3	17 40.0	21.7	17 39.0	27.7	17 31.4	12.6	17 29.0	11.3	17 32.2	11.0	17 43.3
26.7	41.8	24.0	41.6	30.0	14 33.5	14.9	31.2	13.7	35.2	13.2	45.4
—	43.2	28.5	42.8		35.3	19.4	33.1	18.3	37.1	18.0	47.5
—		30.9				21.8		20.7		20.3	
—		33.2				24.2		22.9		22.5	
1101		2129			155	2331		2796		2759	
						120		180		180	
			16 58.30		16 48.30	1131	16 46.30	996	16 54.50	959	16 56.37
17 22.020	17 41.67	17 19.355	17 41.13	16.194	17 33.40	17 10.282	17 31.10	17 9.055	17 34.83	17 8.718	17 45.40
22.003		19.338		16.177		10.265		9.038		8.701	
+ 38.85		+ 41.63		+ 44.65		+ 50.55		+ 51.698		+ 52.076	
− .05		− .10		− .08		− .14		− .14		− .15	
− 1.68 +1.339		− 1.66 +1.359		− 1.64 +1.379		− 1.54 +1.479		− 1.51 +1.509		− 1.50 +1.519	
+ 37.12		+ 39.77		+ 42.93		+ 48.87		+ 50.03		+ 50.41	
17 22.00		17 19.34		17 16.17 8		17 10.26		17 9.04		17 8.70	
17 59.12		17 59.11		17 59.18		17 59.13		17 59.07		17 59.11	
2.139		2.129		2.129		2.149		2.089		59.107	2.129
− 19.65	− 19.65	+ 21.05	− 21.78	+ 27.89	− 17.21	+ 23.98	− 20.82	(2nd reading) + 14.55	− 25.78	+ 12.35	− 36.68
40		40		40		40		40		40	
1 − 2.08		− 2.13		− 2.18		− 2.19		− 2.17		− 2.14	
4 33.5	0 17.9	4 31.7	0 19.5	4 22.6	0 14.0	4 24.9	0 16.0	0 21.3		4 36.5	0 31.0
44.1	28.6	41.9	31.6	42.1	34.1	32.9	24.9	32.1		50.0	46.1
77.6	46.5	73.6	51.1	64.7	48.1	57.8	40.9	53.4		86.5	77.1
44 38.80	45 23.25	44 36.80	45 25.55	44 32.35	45 24.05	44 28.90	45 20.45	45 26.70		44 43.25	45 38.55
~~1.29336n~~	1.29836	1.32325	1.33806	1.44545	1.23578n	1.37985	1.31848n	1.16286	1.41128n	1.09167	1.56443
~~1.35393n~~	1.35393n	1.38382	1.39863n	1.56602	1.29635n	1.44042	1.37905n	1.22343	1.47185n	1.15224	1.62500
~~+22.59~~	−22.59	+ 24.26	−25.04	+32.07	−19.79	+27.57	−23.94	+16.73	−29.64	+14.20	−42.17
44 ~~16.21~~	45 0.66	45 1.06	45 0.57	45 4.42	45 4.26	44 56.47	45 56.51	45 43.43	45 4 57.06	44 57.45	44 56.38
+26° 37′	47″.69	47.29	37 47.84	37 43.93	44.09	37 51.88	51.84		36 7 51.29	37 50.90	51.97
		47.56		44.01		51.86				51.43	
	+15	34 20	35 8							34 26	35 21
		1.20540	1.20580							1.20540	1.20580
+11 30		+10 25		−10 97		−5 63		−4 99		−7 91	
1.21670	1.21710	1.21565	1.21605	1.19443	1.19483	1.19977	1.20017	1.20041	1.20081	1.19749	1.19789
−16.47	−16.48	−16.43	−16.45	−15.65	−15.66	−15.84	−15.86	−15.86	−15.88	−16.12	−16.14
	−08 −.09	−10 −.15	−10	−16 −.30	−06	−12 −.29	−09	−05 −.09	−14	−.03 −.16	−29
−.09	−.01	−.09	−.01	−36	−.03	−36	−.02	.00	.00	.00	.00
	−16.57	−16.62	−16.56	−16.17	−15.75	−16.32	−15.97	−15.91	−16.02	−16.15	−16.43
+26 37	31.12	30.67	37 31.28	37 27.76	28.34	37 35.56	35.87		37 35.27	37 34.75	35.54
+10 19.51	18.95	+19.87	19.30	+ 22.17	21.59	+ 16.01	15.42	+ 15.31	14.73	+ 16.63	16.06
− .56	−18.14	− .57	−18.57	− .58	−18.99	− .59	−20.38	− .58	−20.73	− .57	−20.84
+1.87		+1.44		+1.02		−0.37		−0.72		−0.83	
+10 20.82		+ 20.74	51.91	+ 22.61	50.37	+ 15.05	50.61	+ 14.01		+ 15.23	49.98
			52.02		50.95		50.92				50.77
	47 51.94		51.71		50.66		50.76		49.28		50.37
	44 31.93		31.70		30.65		30.75		29.27		30.36

18 2.21
47 31.17
+3.019
−20.01

9.95065
.12552
.07617

1875

May 12		May 13		May 27		June 1	
−.320		−.310		−.510		−.500	
17 49.8	17 40.3	17 48.9	17 40.9	17 47.1	17 36.8	17 48.0	17 36.7
51.3	42.3	51.2	43.2	49.3	38.4	51.3	38.9
53.6	45.0	53.5	45.1	51.7	40.2	52.5	40.5
58.2		58.1		56.4		57.0	
18 0.5		18 0.4		58.7		59.3	
2.8		2.7		18 1.0		1.5	
5.1	18 13.9	5.0	18 26.0	3.3	18 23.2	4.3	18 11.4
7.4	16.0	9.4	28.2	5.8	25.8	6.5	13.7
12.1	18.5	11.9	30.4	10.2	27.8	11.0	15.1
14.4		14.2		12.7		13.3	
16.7		16.6		14.8		15.6	
2711		2699		3110		3193	
240		240		300		300	
311	17 42.53	299	17 43.07	11 0	17 38.47	19 3	17 38.70
18 2.827	18 16.13	18 2.718	18 28.20	18 1.000	18 25.60	18 1.755	18 13.40
2.810		2.701		0.083		1.738	
+ 1.44		+ 1.58		+ 3.29		+ 2.38	
− .16		− .16		− .26		− .25	
− 2.00		− 1.99		− 1.86		− 1.81	
− 0.72		− 0.5~~8~~7		+ 1.17		+ 0.32	
18 2.81		18 2.70		18 1.06		18 1.74	
18 2.09		18 2.1~~1~~3		18 1.25		18 2.06	
						2.128	
15 +20.30	−13.30	15 +19.65	−25.48	15 +22.53	−24.60	15 +23.05	−11.65
1 −2.41		−2.38		−2.07		−2.04	
3 23.6	4 5.3	3 25.6	4 19.4	3 19.8	4 16.4	3 16.8	3 57.8
41.5	21.8	41.6	35.9	43.9	39.9	38.4	19.0
63.1	27.1	67.2	55.3	63.7	56.3	55.2	136.8
18 32.55	19 13.55	18 33.60	19 27.65	18 31.85	19 28.15	18 27.60	19 8.40
1.30750	1.12385n	1.29336	1.40620n	1.35276	1.39094n	1.36267	1.06633n
1.38367	1.20002n	1.36953	1.48237n	1.42893	1.46711n	1.43884	1.14250n
+24.19	−15.85	+23.42	−30.36	+ 26.85	−29.32	+27.47	−13.88
18 56.74	18 57.70	18 64.02	18 57.29	18 58.70	18 58.83	18 55.07	18 54.52
3 51.61	50.65	3 51.33	51.06	3 49.65	49.52	3 53.28	53.83
51.13		51.19		49.58		53.55	
34 54	35 26					34 40	35 20
1.20560	1.20590					1.20560	1.20590
−421		+151		−870		+502	
1.20139	1.20169	1.20711	1.20741	1.19690	1.19720	1.21062	1.21092
−15.90	−15.91	−16.11	−16.12	−15.74	−15.75	−16.24	−16.25
−.09 −.40	−.03	−.08 −.47	−.14	−.11 −.47	−.13	−.12 −.60	−.03
−.31	−.38	−.32	−.40	−.31	−.40	−.49	−.57
−16.30	−16.32	−16.51	−16.66	−16.16	−16.28	−16.85	−16.85
3 35.31	34.33	3 34.82	34.40	3 33.49	33.24	3 36.43	36.98
−16 6.48	7.13	− 5.90	6.54	− 4.01	4.56	− 6.20	6.75
− .65		− .64		− .55		− .56	
+3.35		+3.22		+1.46		+ 0.91	
−16 3.78	47 31.53	− 3.32	31.50	− 3.10	30.39	− 5.84	30.59
	30.55		31.08		30.14		31.14
	47 31.04		31.29		30.27		30.86

15 Comae.

1874

12h 20m 42sec
+28° 58′

γ = + 13° 25′
γ sin g = +.23

$\frac{d\alpha}{dt}$
$\frac{d\delta}{dt}$

l cos δ 9.94196
l b .10992
l b′ .05188

l b′ .04796

l sin δ 9.68512

corr α =
corr δ =

tang δ = +.55
I = 2.36 s
k = -.018

1874

May 7		May 10		May 13		May 24		May 27		May 28	
-.105		-.199		.164		~~.268~~ -.272		-.283		-.297	
19 48.2	19 35.1	19 45.6	19 33.6	19 42.4	19 25.8	19 36.4	19 26.3	19 35.3	19 28.5	19 34.8	19 27.3
50.7	37.6	47.8	35.8	44.8	27.7	38.7	28.6	37.5	30.9	37.3	29.2
53.0	39.1	50.3	38.0	47.0	29.6	41.1	30.4	40.0	32.7	39.6	31.3
57.5		54.9		51.8		45.8		44.7		44.3	
59.8		57.1		54.1		48.2		47.0		46.7	
2.3		59.6		56.4		50.6		49.4		49.0	
4.7	20 23.0	2.0	20 15.0	58.9	20 15.6	53.0	20 2.8	51.7	20 0.0	51.3	20 16.1
7.1		4.3	16.6	1.2	17.6	55.3	5.1	54.0	2.4	53.5	18.5
11.7		9.0	18.4	5.9	20.2	59.9	6.6	58.8	4.5	58.4	21.0
14.1		11.4		8.3		2.4		1.2		0.8	
16.5		13.9		10.7		4.7		3.5		3.1	
3256		3559		3815		4361		4231		4188	
300		300		240		120		120		120	
256	19 37.27	6559	19 35.80	6215	19 27.70	5561	19 28.43	5431	19 30.70	5388	19 29.27
20 2.327	20 23.00	1959.627	20 16.67	1956.500	20 17.80	1950.555	20 4.83	1949.373	20 2.30	1948.982	20 18.53
2.309		59.609		56.482		50.537		49.355		48.964	
+ 38.85		+ 41.53		+ 44.65		+ 50.55		+ 51.68		+ 52.07	
— .06		— .11		— .09		— .15		— .15		— .16	
— 1.74	+1.258	— 1.72	+1.278	— 1.69	+1.308	— 1.59	+1.408	— 1.56	+1.438	— 1.55	+1.448
+ 37.05		+ 39.70		+ 42.87		+ 48.81		+ 49.97		+ 50.36	
20 2.31		19 59.61		19 56.48		19 50.54		19 49.35		19 48.96	
20 39.36		20 39.31		20 39.35		20 39.35		20 39.32		20 39.32	
42358		42.308		42.348		42.348		42.318		42.318	

+22.17	-23.56	+23.83	-17.04	+28.80	-21.30	+22.12	-14.28	+18.67	-12.93	+19.71	-29.55
30		30		30		30		30		30	
-2.08		-2.13		-2.18		-2.19		-2.17		-2.14	
4 12.9	0 4.2	4 14.2	0 0.3	~~3~~ 4 7.2	0 3.7	4 12.3	4 54.3	4 15.1	4 50.7	4 13.0	0 13.1
20.7	13.9	22.7	10.1	25.3	22.1	17.8	1.9	22.2	59.9	23.3	20.7
33.6	18.1	36.9	10.4	32.5	25.8	30.1	116.2	37.3	110.6	36.3	33.8
34 16.80	35 9.05	34 18.45	35 5.20	~~33~~ 4 16.25	35 12.90	34 15.55	34 58.10	34 18.65	34 55.30	34 18.15	35 16.90
1.34577	1.37218n	1.37712	1.23147n	1.45939	1.32838n	1.34479	1.15473n	1.27114	1.11160	1.29469	1.47056
1.39765	1.42406n	1.42900	1.28335n	1.51127	1.38026n	1.39667	1.20661n	1.32302	1.16348	1.34657	1.52244
+24.99	-26.55	+26.86	-19.20	+32.45	-24.00	+24.93	-16.09	+21.04	-14.57	+22.21	-33.30
34 41.79	34 42.60	34 45.31	34 46.00	~~33~~ 4 48.70	34 48.90	34 40.48	34 42.01	34 39.69	34 40.73	34 40.36	34 43.60
+28° 48′ 6.56″	5.85	48 3.04	2.35	4~~8~~ 7 59.65	59.45	48 7.87	6.34	48 8.66	7.62	48 7.99	4.75
6.20		2.69		59.55		7.10		~~7.64~~ 8.14		6.37	
+13 24 .00	24 52										
1.13730	1.13780										
+1138		+1032		-1087		-549		-490		-783	
1.14868	1.14918	1.14762	1.14812	1.12643	1.12693	1.13181	1.13231	1.13240	1.13290	1.12947	1.12997
-14.08	-14.10	-14.05	-14.07	-13.38	-13.40	-13.55	-13.56	-13.57	-13.58	-13.47	-13.49
-.11 -.16	-.12	-.12 -.14	-.07	-.17 -.27	-.10	-.11 -.44	-.04	-.08 -.05	-.03	-.08 -.13	-.19
-.09	.00	-.09	.00	-.26	-.02	-.34	-.40	.00	.00	.00	.00
-14.28	-14.22	-14.26	-14.14	-13.81	-13.52	-14.00	-14.00	-13.65	-13.61	-13.55	-13.68
+28 47 52.28	51.63	47 48.78	48.21	48 45.84	45.93	47 53.87	52.34	47 55.01	54.01	47 54.44	51.07
+10 19.51	19.04	+19.87	19.39	+22.17	21.67	+16.01	+15.51	+15.31	14.82	+16.63	16.14
— .47	-18.60	— .48	-19.05	— .50	-19.49	— .50	-20.96	— .49	-21.33	— .49	-21.44
+1.46		+1.01		+0.57		~~+~~0.90		-1.27		~~-7~~ 1.38	
+10 20.50	58 12.78	+ 20.40	9.18	+ 22.24	8.08	+ 14.61	8.48	+ 13.55	8.56	+ 14.76	9.20
	12.13		8.61		8.17		6.95		7.56		5.83
	58 12.16		8.90		8.12		7.71		8.06		7.52
	57 ~~50.40~~ 52.46		48.84		48.06		47.65		48.00		47.46

1875
α 20 42.35
δ 57 47.84
$\frac{d\alpha}{dt}$ +2.998
$\frac{d\delta}{dt}$ −20.06

l. cos δ 9.94196
l b .12552
l b' .06748

1874		1875							
June 2		May 12		May 13		May 27		June 1	
−220		−.320		−.310		−.510		.500	
12 19 32.8	19 22.2	20 29.0	21 17.7	20 28.8	20 19.4	20 27.1	20 17.8	20 27.9	20 16.6
35.2	25.0	31.3	19.8	31.2	22.6	29.5	20.0	30.2	18.5
37.6	26.8	33.7	22.1	33.6	24.9	32.0	22.0	32.5	19.8
42.3		38.3		38.3		36.5		37.1	
44.6		40.8		40.5		38.9		39.7	
46.9		43.2		43.0		41.3		42.0	
49.4	20 9.1	45.5	20 54.4	45.3	21 5.3	43.7	20 57.2	44.4	20 58.6
51.8	11.9	47.8	56.7	47.7	7.2	46.0	59.2	46.8	1.0
56.5	13.3	52.6	58.9	52.3	9.4	50.7	1.2	51.5	3.7
58.8		54.9		54.8		53.0		53.9	
1.0		57.3		57.1		55.4		56.3	
4569		4744		4726		4541		4623	
560									
5169	19 24.67		20 19.87		20 22.30		20 19.93		20 18.30
19 46.991	20 11.43	20 43.127	20 56.67	20 42.964	21 7.30	20 41.282	20 59.20	20 42.027	21 1.10
46.973		43.109		42.946		41.264		42.009	
+ 53.945		+ 1.44		+ 1.58		+ 3.29		+ 2.38	
− .12		− .18		− .17		− .28		− .27	
− 1.49	+1.508	− 2.06		− 2.05		− 1.92		− 1.86	
+ 52.34		− 0.880		− 0.64		+ 1.09		+ 0.25	
19 46.97		20 43.11		20 42.95		20 41.26		20 42.01	
20 39.31		20 42.~~32~~ 31		20 42.31		20 42.35		20 42.26	
42308								42.286	
39.331									
30 +22.32	−24.44	5 +23.26	−13.54	5 +20.66	−24.34	5 +21.35	−17.92	5 +23.73	−19.07
−2.42		−2.41		−2.38		−2.07		−2.04	
4 10.0	0 2.0	3 6.9	3 50.1	3 10.0	4 2.9	3 5.4	3 52.1	3 1.0	3 52.8
18.1	12.8	24.2	7.4	26.5	19.0	30.0	17.1	23.0	14.0
28.1"	148	311	1175	365	219	354	1292	240	1268
34 14.05	35 7.40	8 15.55	8 58.75	8 18.25	9 10.95	8 17.70	9 4.60	8 12.00	9 3.40
1.34869	1.38810n	1.36661	1.13162n	1.31513	1.38632n	1.32940	1.25334n	1.37530	1.28085n
1.39665	1.43606n	1.43409	1.19910n	1.38261	1.45380	1.39688	1.32082n	1.44278	1.34783n
+24.93	−27.29	+27.17	−15.82	+24.13	−28.43	+24.94	−20.93	+27.72	−22.28
34 38.98	34 40.11	8 42.72	8 42.93	8 42.38	8 42.52	8 42.64	8 43.67	8 39.72	8 41.12
48 9.37	8.24	14 5.63	5.42	14 5.97	5.83	14 5.71	4.68	14 8.63	7.23
8.80		5.52		5.90		5.19		7.93	
23 57	24 50	24 27	25 11					24 24	25 15
1.13730	1.13780	1.13750	1.13800					1.13750	1.13880
+26		−421		+160		−850		+502	
1.13756	1.13801	1.13329	1.13379	1.13910	1.13960	1.12900	1.12950	1.14252	1.14302
−13.73	−13.74	−13.59	−13.30	−13.77	−13.79	−13.46	−13.47	−13.88	−13.90
−.11	−.03 −.13	−.12	−.40 −.04	−.09	−.45 −.13	−.10	−.42 −.07	−.12	−.61 −.08
+.17	.00	−.29	−.36	−.30	−.38	−.30	−.37	−.45	−.57
−13.67	−13.87	−14.00	−14.00	−14.16	−14.30	−13.86	−13.91	−14.45	−14.55
47 55.70	54.37	13 51.63	51.42	13 51.81	51.53	13 51.85	50.77	13 54.18	52.68
+10 15.52	15.04	−16 6.48	7.03	− 5.90	6.44	− 4.01	4.48	− 6.20	6.66
− .48	−21.98	− .55		− .54		− .47		− .46	
~~1.72~~	1.92	+ 2.91		+2.77		+0.94		+0.38	
+10 13.12	8.82	−16 4.12	47.51	− 3.67	48.14	− 3.54	48.31	− 6.28	47.90
	7.49		47.30		47.86		47.23		46.90
	58 8.15		57 47.40		48.00		47.71		47.15
	57 48.09								

δ Corvi.

12h 23m 24s

−15° 49'

ζ = +58° 12'

ζ sin ζ = +.85

	1874	1875
α		23 23.94
δ		49 8.68
dα/dτ		+3.099
dδ/dτ		−20.09
l.cos δ	9.98324	9.98324
l.b	.10992	.12552
l.b'	.09316	.10876
l.b'	.08924	
l sin δ	9.43546n	

cos α =

cos δ =

tang δ = −.28

I = .214 s

k = −.016 s

1874 … 1874 … 1875

May 13 | May 24 | May 27 | May 28 | June 2 | May 12

−.164 | ~~−.268~~ −2.72 | −.283 | −.297 | −220 | −320

22 24.4 22 14.0 22 — 22 39.5 22 17.2 22 9.1 22 16.9 22 8.7 22 15.0 22 05 23 11.0 23 0.3

26.8 16.4 — 42.0 19.3 11.7 19.0 10.3 17.1 2.1 13.2 2.8

28.7 18.3 — 44.4 21.6 14.0 21.2 12.6 19.1 8.9 15.3 4.8

33.0 — 25.8 25.5 23.5 19.6

35.1 31.24 29.1 28.0 27.6 25.5 21.7

37.3 .30 31.3 30.3 29.7 27.7 23.9

39.4 22 47.4 .26 33.4 23 8.2 32.2 22 44.0 31.9 22 51.1 29.9 22 49.9 26.0 23 48.7

41.5 49.2 .42 35.7 34.5 46.5 34.1 53.8 32.0 51.4 28.2 50.3

45.8 51.1 .24 39.8 38.7 48.2 38.2 56.0 36.4 52.9 32.4 52.4

48.41 .10 41.8 40.8 40.4 38.5 34.5

50.2 .36 44.2 43.0 42.6 40.7 36.7

41.01 22 16.23 25.53 22 41.97 33.14 22 11.60 32.71 22 10.53 30.54 22 2.17 26.25 23 2.63

22 37.282 22 49.23 22 ~~36.471~~ 31.274 23 8.20 22 30.127 22 46.23 22 29.736 22 53.63 22 27.764 22 ~~51.07~~ 51.40 23 23.864 23 50.47

37.266 31.258 30.111 29.720 27.748 23.848

May 13	May 24	May 27	May 28	June 2	May 12
+ 44.65	+ 50.56	+ 51.69	+ 52.07	+ 62.96	+ 1.44
+ .04	+ .08	+ .08	+ .08	+ .06	+ .09
− 1.22 +1.879	− 1.15 +1.949	− 1.15 +1.969	− 1.12 +1.979	− 1.08 +2.019	− 1.53
+ 43.47	+ 49.48	+ 50.64	+ 51.03	+ 52.94	0.00
22 37.27	22 31.26	22 30.11	22 29.72	22 27.75	23 23.85
23 20.74	23 20.74	23 20.75	23 20.75	23 20.69	23 23.85
23.839	23.839	23.849	23.849	23.789 20.734	

+21.05 −11.95 − 10.70 − 36.93 +18.53 −16.10 +19.21 −23.89 +25.59 −23.37 (64) +21.23 −26.61

20 20 20 20 15 50

−2.18 −2.19 −2.77 −2.14 −2.12 −2.41

0 2.0 0 43.0 0 40.4 1 13.0 0 1.3 0 44.9 0 0.0 0 52.9 4 51.1 0 51.1 3 58.1 0 59.5

28.3 9.7 55.1 27.9 17.8 0.8 20.7 13.1 8.5 9.0 11.8 13.7

30.3 112.7 95.5 40.9 19.1 105.7 20.7 136.0 119.6 120.1 129.9 133.2

20 15.15 20 56.35 20 47.75 21 20.45 20 9.55 20 52.85 20 10.35 21 3.00 19 59.80 20 (21) 0.05 54 4.95 56 (55) 6.60

1.32325 1.07757n 1.02938n 1.56738n 1.26788 1.20683n 1.28353 1.37822n 1.40807 1.37365n 1.32695 1.42504n

1.41641 1.17053n 1.12254n 1.66054n 1.36104 1.29999n 1.37669 1.47138n 1.49731 1.46089n 1.43571 1.53380n

+26.09 −14.81 −13.26 −45.77 +22.96 −19.95 +23.81 −29.61 +31.43 −29.03 +27.27 −34.18

20 41.24 20 41.54 20 34.49 20 34.68 20 32.51 20 32.90 20 34.16 20 33.39 20 31.23 20 31.02 54 32.22 54 32.42

−15° 57' 52.89" 53.19 57 46.14 46.33 57 44.16 44.55 57 45.81 ~~50.04~~ 57 42.88 42.67 31 43.87 44.07

53.04 46.23 44.35 45.42 45.04 42.77 43.97

+58 9 58 10 39 9 43 10 43 10 17 11 19

1.96604 1.96624 1.96596 1.96624 1.96612 1.96640

−1079 −538 −482 −778 +34 −421

1.95525 1.95545 1.96066 1.96086 1.96122 1.96142 1.95826 1.95846 1.96630 1.96658 1.96191 1.96219

−90.21 −90.25 −91.34 −91.38 −91.46 −91.50 −90.84 −90.88 −92.53 −92.59 −91.60 −91.66

− 1 − 1 − 1 − 1 − 1 − 1 − 1 − 1 − 1 − 1 0 0

+.06 .00 +.02 +.01 +.01 +.18 +.04 +.03 +.03 +.05 +.06 +.08 +.09 +.20 +.08 +.06 −.11 +.10

−.02 −.07 −.06 −.10 .00 .00 .00 .00 +.20 +.04 −.37 −.01

−1 30.18 −1 30.31 −1 31.40 −1 31.31 −1 31.43 −1 31.48 −1 30.80 −1 30.81 −1 32.25 −1 32.48 −1 31.91 −1 31.57

−15 59 23.07 23.50 59 17.54 17.64 59 15.59 16.03 59 16.61 15.85 59 15.13 15.15 33 15.78 15.64

+10 22.17 20.32 +16.01 14.15 +15.31 13.47 +16.63 14.82 +15.52 13.72 −16 6.48 8.52

− 1.85 −7.50 − 1.86 −7.40 − 1.84 −7.41 − 1.81 −7.42 − 1.80 −7.47 − 2.04

+12.59 +12.69 +12.68 +12.67 +12.62 +14.75

+10 32.91 48 50.16 + 26.84 50.70 + 27.15 49.44 + 27.49 49.12 + 26.34 48.79 −15 53.77 9.55

50.59 50.80 49.88 48.36 48.81 9.41

48 50.37 50.75 49.66 48.74 48.80 49 9.48

49 10.46 10.84 9.75 8.83 8.89

1875

May 13				May 23				May 26				May 27				June 1			
	−.310				−.500				−.532				−.510				−.500		
23	10.8	23	1.3	23	9.6	23	4.2	23	9.2	23	10.2	23	9.2	23	6.1	23	9.8	22	59.3
	12.9		3.4		11.8		5.9		11.3		11.9		11.2		7.7		12.0		2.0
	15.1		5.0		13.8		7.4		13.4		13.8		13.4		9.6		14.1		3.5
	19.4				18.0				17.7				17.7				18.5		
	21.6				20.2				19.8				19.9				20.6		
	23.6	23	44.7		22.4				21.9				22.0				22.8		
	25.9		46.2		24.3	−23	51.1		24.0	23	46.8		24.1	23	37.0		24.9	23	42.1
	28.0		48.7		26.7		53.0		26.2		48.7		26.3		39.0		27.0		44.0
	32.3				30.9		55.2		30.3		50.8		30.5		41.0		31.1		46.1
	34.5				33.0				32.6				32.7				33.4		
	36.7				35.3				34.8				34.8				35.7		
	26 08	23	3.23		24 62	23	5.83		24 12	23	11.97		24 18	23	7.80		24 99	23	1.60
23	23.709	23	46.53	23	22.382	23	53.10	23	21.927	23	48.77	23	21.982	23	39.00	23	22.718	23	44.07
	23.693				22.366				21.911				21.966				22.702		
+	1.58			+	2.81			+	3.22			+	3.29			+	2.38		
+	.09			+	.14			+	.15			+	.14			+	.14		
−	1.52			−	1.45			−	1.43			−	1.43			−	1.39		
+	0.15			+	1.50			+	1.94			+	2.00			+	1.13		
23	23.69			23	22.37			23	21.91			23	21.97			23	22.70		
23	23.84			23	23.87			23	23.85			23	23.97			23	23.83		
																	23.868		
50	+20.48		−22.82	50	+16.55		−30.72	50	+9.96		−26.84	50	+14.18		−17.02	50	+21.12		−21.35
	−208				−213				−209				−207				−2.04		
4	0.0	4	54.0	4	4.2	0	4.5	4	14.5	0	1.3	4	8.0	4	49.0	3	53.1	4	48.1
	11.3		9.2		21.5		22.8		33.6		21.8		27.8		10.0		10.8		7.1
	11.3		1232		257		273		481		231		358		1190		1239		1152
54	5.65	55	1.60	54	12.85	55	13.65	54	24.05	55	11.55	54	17.90	54	59.50	54	1.95	54	57.60
	1.31133		1.35832 n		1.21880		1.48742		0.99826		1.42878 n		1.15168		1.23096 n		1.32469		1.32940 n
	1.42009		1.46708 n		1.32756		1.59618 n		1.10702		1.53754 n		1.26074		1.33972 n		1.43345		1.43816 n
	+26.31		−29.31		+21.26		−39.46		+12.80		−34.48		+18.23		−21.87		+27.13		−27.43
54	31.96	54	32.29	54	34.11	54	34.19	54	36.85	54	37.07	54	36.13	54	37.63	54	29.08	54	30.17
31	43.61		43.94	31	45.76		45.84	31	48.50		48.72	31	47.78		48.28	31	40.73		41.82
	43.77				45.80				48.61				48.03				41.27		
																10	14	11	10
																	1.96610		1.96638
	+168				−687				−1167				−833				+502		
	1.96780		1.96808		1.95925		1.95953		1.95445		1.95473		1.95779		1.95807		1.97112		1.97140
	−92.85		−92.91		−91.04		−91.10		−90.04		−90.10		−90.74		−90.80		−93.57		−93.63
	0		0		− 1		− 1		− 1		− 1		− 1		− 1		0		0
	+.05	−.12	+.07		+.04	−.12	+.13		+.01	−.16	+.10		+.03	−.38	+.04		+.06	−.61	+.06
	−.37		.00		−.38		−.02		−.40		−.02		−.39		−.45		−.56		−.69
−1	33.17	−1	32.84	−1	31.39	−1	31.00	−1	30.44	−1	30.03	−1	31.11	−1	31.28 2	−1	34.07	−1	34.26
33	16.78		16.78	33	17.15		16.84	33	18.44		18.75	33	18.89		19.50	33	14.80		16.08
−16	5.90	7.92		−	5.14	6.95		−	3.47	5.24		−	4.01	5.76		−	6.20	7.93	
−	2.02			−	1.81			−	1.77			−	1.75			−	1.73		
	+14.76				+14.86				+14.86				+14.86				+14.89		
−15	53.16	49	9.94	−	52.09		9.24	−	50.38		9.32	−	50.90		9.79	−	53.64		7.84
			9.41				8.93				9.13				10.40				9.12
		49	9.94				9.08				9.23				10.09				8.48

η Corvi.
h m sec.
12 25 39
− 15° 30′
ζ = + 57° 53′
ζ sin ζ = + .85

	1874	1875
α		25 37.80
δ		30 11.67
dα/dτ		+ 3.081
dδ/dτ		− 19.98
l cos δ	9.98391	9.98391
l.c	.10992	.12552
l.c′	.09383	.10943
l sin δ	9.42690n	

corr α =
corr δ =
l tang δ = − 28
I = 2.15
K = −.016

1874 May 13		1874 May 24		1874 May 27		1874 May 28		1875 May 12		1875 May 13	
−.164		~~−.268~~ −2.72		−.283		−.297		−.320		−.310	
24 36.4	24 25.9	24 32.4	24 18.8	24 31.3	24 19.7	24 31.0	24 22.7	25 —	25 48.7	25 24.8	25 14.2
40.5	27.8	34.6	21.7	33.4	22.0	33.1	25.5	—	50.3	26.9	16.0
42.7	29.5	36.6	23.7	35.5	24.4	35.2	27.7	—	52.3	29.1	17.9
46.8		41.0		39.8		39.4		~~33.4~~		33.4	
49.1		43.1		41.9		41.5		35.5		35.5	
51.7		45.3		44.2		43.7		37.7		37.6	
53.3	25 5.5	47.4	25 2.2	46.2	24 58.7	45.8	24 57.1	39.9		39.8	25 52.9
55.4	7.8	49.5	4.2	48.3	0.2	48.0	59.1	42.1		41.9	
59.7	10.1	53.7	6.2	52.6	2.9	52.2	0.8	—		46.2	
2.0		55.9		54.8		54.4		—		48.4	
4.2		58.2		57.0		56.8		—		50.4	
4433 120		4977 ~~4457~~		4850		4811		1886		4140	
5633	24 27.73		24 21.77		24 22.03		24 25.30		25 50.43		25 16.03
24 51.209	25 7.80	24 ~~45.064~~ 45.245	25 4.20	24 44.091	25 0.60	24 43.736	24 59.00	25 37.820		25 37.636	25 52.90
51.193		45.229		44.075		43.720		25 37.704		37.620	
+ 44.65		+ 50.55		+ 51.69		+ 52.07		+ 1.44		+ 1.58	
+ .04		+ .08		+ .08		+ .08		+ .09		+ .09	
− 1.23	+1.851	− 1.16	+1.921	− 1.14	+1.941	− 1.13	+1.951	− 1.54	+ ~~1.541~~	− 1.53	
+ 43.46		+ 49.47		+ 50.63		+ 51.02		− 0.01		+ 0.14	
24 51.19		24 45.23		24 44.07		24 43.72		25 37.70		25 37.62	
25 34.65		25 34.70		25 34.70		25 34.74		25 37.69		25 37.76	
37.731		37.781		37.781		34.698	37.821				
0 + 23.48	− 16.59	0 + 23.29 .47	− 19.14 8.96	0 + 22.06	− 16.51	0 + 18.44	− 15.26	35 − 12.71		35 + 21.61	− 15.26
− 2.18		− 2.19		− 2.17		− 2.14		− 2.41		− 2.38	
8 3.2	1 52.7	8 1.1	1 53.7	8 1.7	1 49.8	1 6.6	1 47.3	0 46.6		0 2.8	0 50.1
1 29.4	18.7	1 15.1	8.9	1 18.0	5.1	27.7	8.2	0.5		15.8	3.0
32.6″	131.4	16.2	122.6	19.7	114.9	34.3	115.5	107.1		18.6	113.1
8 1 16.30	8 2 5.70	8 1 8.10	8 2 1.30	8 1 9.85	1 57.45	1 17.15	1 57.75	35 53.55		35 9.30	35 56.55
1.37070	1.21985n	1.37051	1.27784n	1.34361	1.21775n	1.26576	1.18355	1.10415n		1.33465	1.18355n
1.46453	1.31368n	1.46434	1.37167n	1.43744	1.31158n	1.35959	1.27738	1.21358n		1.44408	1.29298n
+ 29.14	− 20.59	+ 29.13	− 23.53	+ 27.38	− 20.49	+ 22.89	− 18.94	− 16.35		+ 27.80	− 19.63
8 1 45.44	8 1 45.11	8 1 37.23	8 1 37.77	8 1 37.23	8 1 36.96	8 1 40.04	8 1 38.81	35 37.20		35 37.10	35 36.92
− 15° 37/8 57.09 56.92	56.76	37/8 48.88 49.15	49.42	37/8 48.88 48.74	48.61	37/8 51.69 50.57	49.46	12 48.85		12 48.75 48.16	47.57
+ 57° 52′ 8″ 1.96100									+ 57 51	21	52 8
										1.96083 + 175	1.96103
− 1071		− 527		− 474		− 770		− 421			
1.95029		1.95573		1.95626		1.95330		1.95662		1.96258	1.96278
− 89.18	− 89.18	− 90.31	− 90.31	− 90.42	− 90.42	− 89.80	− 89.80	− 90.49		− 91.74	− 91.78
− 1	− 1	− 1	− 1	− 1	1	− 1	− 1	0		0	0
+ .07 .00	+ .03	+ .07 + .01	+ .05	+ .07 + .05	+ .03	+ .04 + .03	+ .03	+ .02 ~~− .03~~		+ .07 .00	+ .03
− .02	− .09	− .01	− .08	.00	.00	.00	.00	− .08 − .06		− .02	− .08
− 1 29.14	− 1 29.25	− 1 30.26	− 1 30.35	− 1 30.36	− 1 30.40	− 1 29.77	− 1 29.78	− 1 30.55		− 1 31.69	− 1 31.83
− 15 39 26.23	26.01	39 19.14	19.77	39 19.24	19.01	39 21.46	19.24	14 19.40		14 20.44	19.40
+ 10 22.17	20.32	+ 16.01	14.15	+ 15.31	13.47	+ 16.63	14.82	− 16 6.48	8.52	− 5.90	7.92
− 1.85	− 7.42	− 1.86	− 7.34	− 1.84	− 7.35	− 1.81	− 7.35	− 2.04		− 2.02	
+ 12.56		+ 12.64		+ 12.63		+ 12.63		+ 14.72		+ 14.74	
+ 10 32.88		+ 26.79		+ 26.10		+ 27.45		− 15 53.80		− 15 53.18	13.62
28 53.35	53.13	28 52.35	52.98	28 53.14	52.91	28 54.01	51.79				12.58
28 53.24		28 52.61		28 53.02		28 52.90					
13.22		12.59		13.00		12.88		30 13.20			13.10

1875

May 23		May 26		May 27	
-.500		-.552		-.570	
25- 23.4	25- 17.0	25- 23.0	25- 15.0	25- 23.0	25- 16.7
25.5	18.3	25.3	17.8	25.2	17.9
27.6	20.2	27.4	19.7	27.3	19.8
31.9		31.4		31.5	
34.2		33.8		33.8	
36.4		36.0		35.9	
38.6	25- 52.0	38.2	25- 54.3	38.0	25- 52.5
40.6	54.5	40.3	56.8	40.2	55.2
45.0	56.5	44.4	58.3	44.5	57.3
47.0		46.6		46.5	
49.1		48.8		48.8	
3993	25 18.50	3955	25 17.50	3947	25 18.13
25 36.300	25 54.33	25 35.955	25 56.47	25 35.882	25 55.00
36.284		35.939		35.766	
+ 2.81		+ 3.22		+ 3.29	
+ .14		+ .15		+ .14	
- 1.47		- 1.45		- 1.44	
+ 1.48		+ 1.92		+ 1.99	
25 36.28		25 35.94		25 35.77	
25 37.76		25 37.86		25 37.76	
				37.766	
35 +17.80	-18.03	35 +18.45	-20.52	35 +17.75	-19.12
1 -2.13		-2.09		-2.07	
0 6.9	0 52.9	0 6.9	0 57.0	0 7.7	0 55.6
24.8	11.9	28.4	18.2	27.9	17.0
30.7	12.48	3.53	13.52	3.56	13.26
35 15.35	36 2.40	35 17.65	36 7.60	35 17.80	36 6.30
1.25042	1.25600 n	1.26600	1.31218 n	1.24920	1.28149 n
1.35985	1.36543 n	1.37543	1.42161 n	1.35863	1.39092 n
+22.90	-23.20	+23.74	-26.40	+22.84	-24.60
35 38.25	35 39.20	35 41.39	35 41.20	35 40.64	35 41.70
12 49.90	50.85	12 53.04	52.85	12 51.29	52.35
50.37		52.94		51.82	
				51 30	52 18
				1.96086	1.96108
-678		-1154		-817	
1.95405	1.95425	1.94929	1.94945	1.95269	1.95291
-89.96	-90.00	-88.98	-89.02	-89.68	-89.72
- 1	- 1	- 1	- 1	- 1	- 1
+.04	-.01 +.04	+.04	-.02 +.05	+.04	-.02 +.05
-.02	-.09	-.03	-.10	-.03	-.10
-1 29.95	-1 30.06	-1 28.98	-1 29.08	-1 29.68	-1 29.78
14 19.85	20.91	14 22.02	21.93	14 20.97	22.13
-16 5.14	6.95	-3.41	5.24	-4.01	5.76
- 1.81		- 1.77		- 1.75	
+14.85		+14.85		+14.82	
-15 52.10	11.95	- 50.39	12.41	- 50.94	11.91
	13.01		12.32		13.07
	30 12.48		12.36		12.49

β Corvi.
12h 27m 49 sec.
−22° 42′
Z = +65° 5′
sin z = +.91

	1874	1875
α		27 49.47
δ		42 17.80
dα/dT		+ 3.135
dδ/dT		− 19.96
l cos δ	9.96498	9.96498
l 6	.10992	.12552
l 6′	.07490	.09050
l sin δ	9.58648n	

cons =
cons δ =
2 tan δ = −.42
5
I = 2.23
K = −.017

	1874				1874		1875					
	May 13		May 27		May 28		May 23		May 26		May 27	
	−.164		−.283		−.297		−.500		−.552		−.510	
	26 49.3	26 28.9	26 42.1	26 32.3	26 41.7	26 32.2	27 34.4	27 24.8	27 33.8	27 25.7	27 —	27 25.9
	51.7	30.7	44.4	34.8	43.9	34.9	36.7	26.2	36.2	27.6	—	27.5
	53.9	32.7	46.7	36.5	46.3	37.0	39.0	27.7	38.6	29.8	—	29.5
	58.3		51.0		50.7		43.3		43.0		42.9	
	0.5		53.3		53.0		45.6		45.3		45.3	
	2.7		53.5		53.3		47.8		47.4		47.4	
	5.9	27. 26.4	57.8		57.4	27 17.4	50.1		49.6		49.8	
	7.2	28.0	0.0		59.7		52.3		51.9		52.0	
	11.7	30.4	4.5		4.2		56.8		56.2		—	
	13.8		6.7		6.4		59.0		58.8		—	
	16.2		9.0		8.7		1.4		1.0		—	
	2712		3710		4273		4664		4618		2374	
	240		240		180		60		60			
	312	26 30.77	611 0	26 34.53	607 3	26 34.70	5264	27 26.23	5218	27 27.70		27 27.63
	27 2.836	27 28.27	26 55.545		26 55.209	27 17.40	27 47.855		27 47.436		27 47.480	
	2.819		55.528		55.192		47.838		47.419		47.463	
	+ 44.66		+ 51.69		+ 52.07		+ 2.81		+ 3.22		+ 3.29	
	+ .07		+ .12		+ .12		+ .21		+ .23		+ .21	
	− 1.22	+1.915	− 1.12	+2.015	− 1.11	+2.025	− 1.45		− 1.42		− 1.41	
	+ 43.51		+ 50.69		+ 51.08		+ 1.57		+ 2.03		+ 2.09	
	27 2.82		26 55.53		26 55.19		27 47.84		27 47.42		27 47.46	
	27 46.33		27 46.22		27 46.27		27 49.41		27 49.45		27 49.55	
	49.465		49.355			49.405						
					46.273						49.470	
	10 +32.07	−25.43	10 +21.01		10 +20.51	−22.19	45 +21.62		45 +19.74		45 +19.85	
	−2.18		−2.17		−2.14		−2.13		−2.09		−2.07	
	2 31.3	3 39.9	2 40.5		2 40.5	3 33.0	1 41.1		1 43.1		1 41.5	
	57.7	7.8	56.7		0.9	51.4	59.4		3.7		2.0	
	89 0	107 7	97 2		101 4	84 4	100 5		106 8		103 5	
	12′ 44.50″	13 53.85	12 48.60		12 50.70	13 42.20	46 50.25		46 53.40		46 51.75	
	1.50610	1.40535n	1.32243		1.31197	1.34616n	1.33482		1.29535		1.29776	
	1.58100	1.48025n	1.39733		1.38687	1.42106n	1.40972		1.38585		1.38826	
	+38.11	−30.22	+24.96		+24.37	−26.37	+25.69		+24.26		+24.45	
	13 22.61	13 23.63	13 13.56		13 15.07	13 15.83	47 15.94		47 17.66		47 16.20	
−22°	50′ 34.26″	35.28	50 25.21		50 26.72	27.48	24 27.59		24 29.31		24 27.85	
	34.77				27.10							
+65	2 27	3 37			2 34	3 25	3 2		3 5		3 4	
	2.09016	2.09052			2.09019	2.09045	2.09032		2.09035		2.09035	
	−1065		−468		−769		−672		−1145		−805	
	2.07951	2.07987	2.08548	2.08584	2.08250	2.08276	2.08360		2.07890		2.08230	
	−120.09	−120.19	−121.75		−120.92	−120.99	−121.23		−119.92		−120.87	
	− 2	− 2	− 2	− 2	− 2	− 2	− 2		− 3		− 2	
	+.19 −.11	+.12	+.08	~~+.04~~	+.08	+.08 +.09	+.08	~~−.07~~	+.07	~~−.05~~	+.07	~~−.05~~
	−.22	−.34	.00	+.08	.00	.00	−.16	−.08	−.17	−.10	−.17	−.10
	−2 0.14	−2 0.40	−2 1.69		−2 0.86	−2 0.92	−2 1.33		−2 0.65		−2 0.99	
−22	52 34.40	35.68	52 26.90		52 27.58	28.48	26 28.92		26 29.36		26 28.84	
	+10 22.17	20.19	+ 15.31	13.34	+ 16.63	14.69	−16 5.14	7.07	−16 3.47	5.37	− 4.01	5.89
	− 1.98	−5.82	− 1.97	−5.32	− 1.94	−5.30	− 1.93		− 1.90		− 1.88	
	+14.14		+14.64		+14.66		+16.75		+16.83		+16.85	
	+10 34.33	42 0.07	+ 27.98		+ 29.35	5822 ~~5693~~	−15 58.32		− 48.54		− 49.04	
		1.35				5913 ~~5783~~						
				5892								
		42 0.71		41 ~~5488~~		5867 ~~5738~~		42 19.24		17.90		17.88
		20.67		~~1484~~ 18.88		1863 ~~1734~~						

κ Draco.
12h 28m 8sec
+70° 29'
ζ -28° 6
ζ sin z = -.47

1874 47
May 20 28m 9.67s | 28' 67.8"
25 9.45 -.22 | 68.5 +.7
30 9.22 .23 | 69.2 .7
June 4 8.98 .24 | 69.7 .5
9 8.73 .25 | 70.2 .5

1875
May 10 28m 13.18s | 27' 103.7"
15 12.99 -.19 | 104.7 +1.0
20 12.78 .21 | 105.6 .9
25 12.56 .22 | 106.4 .8
30 12.32 .24 | 107.1 .7

corr α =
corr δ =
tang δ = +2.82
I = 6.17s
K = -.04x³s

1875
α 8.143s
δ +28 38.19"
dα/dt +2.595s
dδ/dt -19.918"

1874
α 5.547s
δ +28 58.11"
dα/dt +2.596s
dδ/dt -19.919"

l cos δ 9.52385
l b .10992
l b' 9.63377

ζ =
ζ si

1875
l cos δ 9.52335
l b .12552
l b' 9.64937
l sin δ 9.97430

X 1874
-28
May 24
~~-268~~ -2.72
12 27 7.4 26 40.0 28
10.5 45.1
13.7 50.7
16.4
19.7
23.0
26.0 27 83.2
29.1 38.3
31.3 42.9
17.71 26 45.27
27 19.678 27 38.13

1875
-32
May 12
-320
0.1 27 23.1
3.3 28.1 28
6.3 33.9
9.6
12.8 27 59.4
15.6 5.3
18.9 11.0
21.8
25.2
11.36 27 28.37
28 12.622 28 5.23

-49
May 23
-500
28 27.5
32.8
38.3
11.32 14.4
.28 17.4
.46 20.7
.38 23.7
28 32.87
28 11.360

-55
May 26
-557
28 28 22.0
11.04 17.2
10.76 20.0
10.98 23.3
28 22.00
28 10.927

-52
May 27
-510
28 28 49.7 208
54.9
0.6
10.3
10.82 13.9
10.84 17.0
11.26 20.5
10.88 23.2
28 20.80
28 10.950 28 55.07

α 1874.0 δ
5.48
5.480
.547 58.11
-.067

α 1875.0 δ
8.18
22
17
44
8.253
.143 38.19
+.110

19.635 | 12.579 | 28 11.317 | 10.884 | 10.907
28 9.5048 +50.56 | 28 13.448 +1.47 | 28 12.684 +2.83 | 28 12.521 +8.24 5 | 28 12.476 +3.31
-49.885 -.79 | -.053 -.90 | - 1.32 -1.38 | - 1.63 -1.55 | - 1.55 -1.47

+ 50.55 28m -3.93 | + 1.44 -4.94 | + 2.81 -4.50 | + 3.22 -4.37 | + 3.29 -4.32
- .77 -1.333 5.47 | - .90 8.21 | - 1.41 8.27 | - 1.56 8.21 | - 1.44 8.48
- 3.93 +1.666 28m 5.47 | - 4.94 | - 4.50 | - 4.37 | - 4.32 .43
+ 45.85 | - 4.40 | - 3.10 | - 2.71 | - 2.47
27 19.63 | 28 12.58 | 28 11.32 | 28 10.88 | 28 10.91

18 5300 | 44 4946 | 5045 | 4893 | 4891
28 5.48 +10 16.26 | 28 8.18 -16 5.93 | 28 8.22 -16 4.80 | 28 8.17 -16 3.35 | 28 8.44 -16 3.59
8.076 +1.0 | +1.2 | +1.1 | +1.0 | +1.0
-1030 | -590 | -790 | -840 | -850
+70 28 59.96 | 28 38.83 | 28 38.85 | 28 38.18 | 28 37.82

+34.41 -18.45 | +44.25 +7.39 | - 21.51 | - 11.07 | - 9.85 - 44.12
0 | 35 | 35 | 35 | 35
1 -2.19 | -2.41 | -2.13 | -2.09 | -2.07
4 9.1 4 32.0 | 3 0.3 3 17.1 | 3 26.5 | 3 22.0 | 3 21.8 3 37.0
11.4 34.7 | 17.8 34.1 | 48.2 | 45.9 | 45.6 59.9
20.5" 66.7 | 18.1 51.2 | 74.7 | 67.9 | 67.4 96.9
4 10.25 4 33.35 | 38 9.05 38 25.60 | 38 37.35 | 38 33.95 | 38 33.70 38 48.45

1.53668 1.26600n | 1.64591 0.86864 | 1.33264n | 1.04415n | 0.99344n 1.64464n
1.17045 0.89977n | 1.29328 0.51801 | 0.98201n | 0.69352n | 0.64281n 1.29401n
+14.81 -7.94 | +19.74 +3.30 | - 9.59 | - 4.94 | - 4.39 - 19.68
4 35.06 4 25.41 | 38 28.79 38 28.90 | 38 27.76 | 38 29.01 | 38 29.31 38 28.77

+70°
18 23.29" 22.94 | 44 19.56 19.45 | 44 20.59 | 44 19.34 | 44 19.04 19.48
23.11 | 19.50 | | | 19.26
-28 6 7 5 44 | 5 39 5 22 | | | 5 14 5 0
1.48770n 1.48760n | 1.48760n 1.48750n | | | 1.48750n 1.48740n
-516 | -421 | -670 | -1142 | -801
1.48254 1.48244 | 1.48339 1.48329 | 1.48090 1.48080 | 1.47618 1.47608 | 1.47949 1.47939
+30.38 +30.37 | +30.43 +30.43 | +30.26 | +29.93 | +30.16 +30.16

+.20 -.48 +.06 | +.34 -.47 +.1 | +.08 ~~-.20~~ -.40 | +.02 ~~-.37~~ -.34 | -.51 +.34
-.34 -.37 | -.29 -.31 | -.32 | -.32 | -.32 -.34
+29.84 +29.94 | +29.80 +30.11 | +29.86 | +29.59 | +29.82 +29.48
18 53.13 52.88 | 44 49.36 49.56 | 50.45 | 48.93 | 48.86 48.96
29 8.4 | 28 44.1 | 46.1 | 46.6 | 46.7
+10 15.3 15.5 | -16 5.8 6.5 | 4.4 | 2.8 | 2.2 2.3
+10 18.4 | -16 6.4 | 4.4 | 2.3 | 3.3
+10 16.01 1703 59.86 | -16 6.48 5.35 38.11 | - 5.14 4.14 | - 3.47 2.49 | - 4.01 3.04
+ 1.02 30.22 59.61 | + 1.13 38.31 | + 1.00 | + .98 | + .97 37.32
- 10.30 | - 5.90 | - 7.96 | - 8.40 | - 8.50 37.42
+10 6.73 28 59.73 | -16 11.25 28 38.21 | - 12.04 38.41 | - 10.84 38.04 | - 11.54 ~~37.32~~ 37.37
28 39.81

17
58.11
96
919
2383
992
377

f Virginis
12h 30m 21 sec.
− 5° 9'
ζ = + 47° 32'
l sin ζ = 1.+74

	1874	1875
α		30 21.12
δ		δ 33.91
dα/dt		+ 3.085
dδ/dt		− 19.90
l cos δ	9.99824	9.99824
l6	.10992	.12552
l6'	.10816	.12376
l6'	.10424	
l sin δ	8.95310n	

corr α =
corr δ =
tang δ = −.09
I = 2.07 s
K = −.016 s

335
552
937
430
5.0 δ
38.19

1874 May 13		May 14		May 24		1874 June 2		1875 May 12		May 13	
−.164		−.287		~~−.268~~ −2.72		−.220		−.320		−.310	
12 29 22.8 24.3 26.4 30.8 32.8 34.7 36.8 38.8 42.8 44.9 47.1	29 14.1 16.3 17.9 29 31.6 33.6 35.2	29 21.5 23.5 25.6 29.9 31.9 33.8 35.9 38.1 42.2 44.3 46.2	29 10.1 12.4 14.1 29 45.8 48.2 50.0	29 16.3 18.4 20.4 24.5 26.6 28.7 30.8 32.9 37.0 39.2 41.2	29 2.9 5.5 7.5 29 46.2 48.2 50.2	29 12.7 14.8 17.0 21.0 23.2 25.2 27.2 29.2 33.3 35.4 37.5	29 3.8 5.4 7.1 29 43.2 44.8 46.2	30 8.9 10.9 13.0 17.0 19.1 21.2 23.3 25.4 29.5 31.7 33.8	30 9.3 11.8 13.3 30 45.3 46.8 48.3	30 8.6 10.7 12.9 17.0 19.0 21.2 23.3 25.4 29.4 31.5 33.5	30 0.8 2.8 4.7 30 41.4 43.5 45.9
38.11	29 16.10	37.29	29 12.20	31.60	29 5.30	27.65	29 5.43	23.38	30 11.30	23.25	30 2.77
29 34.645	29 53.47	29 33.900	29 48.00	29 28.727	29 48.20	29 25.136	29 44.73	30 21.255	30 46.80	30 21.136	30 43.67
34.629		33.884		28.711		25.120		21.239		21.120	
+ 44.66 + .01 − 1.31 +1.775 + 43.36 29 34.63		+ 45.38 + .02 − 1.31 +1.775 + 44.09 29 33.88		+ 50.55 + .02 − 1.25 +1.830 + 49.32 29 28.71		+ 53.97 6 + .02 − 1.19 +1.895 + 52.79 29 25.12		+ 1.44 + .03 − 1.63 − 0.16 30 21.24		+ 1.58 + .03 − 1.62 − 0.01 30 21.12	
30 17.99 21.075		30 17.97 21.055		30 18.03 21.115		30 17.91 17.975	20.995	30 21.08		30 21.11	

	40 + 18.54	− 18.83	35 + 21.70	− 14.10	35 + 23.43	− 19.47	35 + 19.71	− 19.59	10 + 9.95	− 25.55	10 + 18.37	− 22.53
	− 2.18		− 2.19		− 2.19		− 2.12		− 2.41		− 2.38	
	0 56.2 21.0 137.2 40 8.60	0 45.0 11.1 116.1 40 58.05	4 51.8 16.9 128.7 40 43.5	0 37.2 3.1 100.3 40 50.15	4 48.1 0.9 109.0 39 54.50	0 43.0 56.0 99.0 40 49.50	4 50.0 5.7 115.7 39 57.85	0 38.9 54.1 93.0 40 46.50	4 4.4 17.1 21.5 14 10.75	4 51.9 5.1 117.0 14 58.50	3 54.4 5.9 120.3 14 0.15	4 48.1 59.8 107.9 14 53.95
	1.26811 1.37627 + 23.78 40 32.38	1.27485n 1.38301n − 24.16 40 33.89	1.33646 1.44462 + 27.84 40 32.19	1.14922n 1.25738n − 18.09 40 32.06	1.36977 1.47798 + 30.06 40 24.56	1.28937n 1.39753n − 24.98 40 24.52	1.39469 1.40285 + 25.29 40 23.14	1.29203n 1.40019n − 25.13 40 21.37	0.99782 1.12158 + 13.23 14 23.98	1.40739n 1.53115 − 33.97 14 24.53	1.26411 1.38787 + 24.43 14 24.58	1.35276n 1.47652n − 29.96 14 23.99
− 5°	17' 44.03" 44.78	45.54	17 43.84 43.77	43.71	17 36.21 36.19	36.17	17 34.79 33.90	33.02 ~~34.32~~	51 35.63 35.90	36.18	51 36.23 35.93	35.64
+ 47	29 52 1.79770 − 1057 1.78713 − 61.25	30 41 1.79780 1.78723 − 61.27	− 554 1.79216 − 61.97	1.79226 − 61.98	− 508 1.79262 − 62.03	1.79272 − 62.05	29 41 1.79760 + 57 1.79817 − 62.83	30 29 1.79780 1.79837 − 62.86	30 23 1.79780 − 421 1.79359 − 62.17	31 10 1.79790 1.79369 − 62.18	+ 188 1.79968 − 63.05	1.79978 − 63.06
	+ .01 − .03 − .01 − 1 1.25	+ .01 − .08 − 1 1.34	+ .02 − .04 − .06 − 1 2.01	+ .01 − .06 − 1 2.03	+ .03 − .20 − .39 − 1 2.39	+ .02 − .06 − 1 2.09	+ .02 + .13 + .20 − 1 2.61	+ .02 + .03 − 1 2.81	+ 1 − .39 − .38 − 1 2.54	+ .03 − .45 − 1 2.60	− .38 + .01 − .36 − 1 3.40	+ .02 − .44 − 1 3.48
− 5	18 45.28 + 10 22.17 − 1.61 + 10.18 + 10 30.74	46.88 20.56 − 9.72 8 14.54 16.14 8 15.34 8 35.24	18 45.85 + 22.47 − 1.62 + 10.15 + 31.00	45.74 20.85 9.75 14.85 14.74 14.79 34.69	18 38.60 + 16.01 − 1.62 + 9.82 + 24.21	38.26 14.39 − 10.08 14.39 14.05 14.22 34.12	18 37.40 + 15.52 − 1.56 + 9.46 + 23.42	35.83 13.96 − 10.44 13.98 12.41 13.20 33.10	52 38.17 − 16 6.48 − 1.78 + 12.41 − 15 55.85	38.78 8.26 8 34.02 34.63 8 34.32	52 39.63 − 16 5.90 − 1.76 + 12.39 − 55.27	39.12 7.66 34.90 34.39 34.64

1875

	May 17				May 22				May 27		
	-340				-425				-510		
12 30	8.4	30	0.1	30	7.8	29	58.7	30	7.0	29	55.3
	10.4		2.1		9.9		0.4		9.0		58.2
	12.3		4.1		11.9		2.2		11.2		59.7
	16.6				16.1				15.2		
	18.7				18.2				17.2		
	20.7				20.2				19.4		
	22.8	30	33.7		22.3	30	39.9		21.5	30	37.2
	24.9		35.7		24.4		41.9		23.5		
	29.0		37.3		28.5		43.7		27.8		
	31.1				30.6				29.7		
	33.3				32.7				31.8		
	22 82	30	2.10		2226	~~29~~ 30	0.43		2133	29	57.73
30	20.745	30	35.57	30	20.236	30	41.83	30	19.391	30	37.20
	20.729				20.220				19.375		
+	1.93			+	2.45			+	3.29		
+	.03			+	.04			+	.04		
−	1.60			−	1.58			−	1.54		
+	036			+	0.91			+	1.79		
30	20.73			30	20.22			30	19.37		
30	21.09			30	21.13			30	21.16		
									21.114		
	S										
10	+18.64		−14.83	10	+19.81		−21.59	10	+21.66		−17.81
	−226				−217				−207		
3	50.9	4	35.1	3	53.0	4	48.4	3	48.0	4	39.0
	2.9		47.4		8.8		4.8		7.9		58.5
	113.8		82.5		121.8		113.2		115.9		97.5
13	56.90	14	41.25	14	0.90	14	56.60	13	57.95	14	48.75
	1.27045		1.17114 n		1.29688		1.33425 n		1.33566		1.25066 n
	1.39421		1.29490 n		1.42064		1.45801 n		1.45942		1.37442 n
	+24.79		−19.72		+26.34		−28.71		+28.80		−23.68
14	21.69	14	21.53	14	27.24	14	27.89	14	26.75	14	24.07
51	33.34		33.18	51	38.89		39.54	51	38.40		35.72
	33.26				39.21				37.56		
								30	10	31	1
									1.79770		1.79790
	+646				−1383				−789		
	1.80426		1.80436		1.78397		1.78407		1.78981		1.79001
	−63.72		−63.73		−60.81		−60.82		−61.63		−61.66
	+.01	−.37	+.01		+.02	−.38	+.02		+.02	−.37	+.01
	−35		−42		−.36		−.44		−.35		−.43
−1	2.06	−1	4.14	−1	1.15	−1	1.24	−1	1.96	−1	2.08
52	37.40		37.32	52	40.04		40.78	52	40.36		38.80
−16	6.87		8.54	−	5.61		7.21	−	4.01		5.54
−	1.67			−	1.60			−	1.53		
	+12.28				+12.12				+11.93		
−15	56.26		33.66	−	55.09		35.13	−	53.61		33.97
			33.58				35.87				32.91
		8	33.62				35.50				33.19

X Virginis

12h 32m 47sec.

−7° 18′

z = + 49° 41′

∫ sin z = +.76

	1874	1875
α		32 47.78
δ		18 25.18
dα/dt		+ 3.091
dδ/dt		− 19.88
l cos δ	9.99647	9.99647
l b	.10992	.12552
l b′	.10639	.12199
l b′	.10247	
l sin δ	9.10402n	

corr α =

corr δ =

log δ = −.13

t = 2.08s

K = −0.16s

1874						1874		1875			
May 13		May 14		May 24		June 2		May 12		May 13	
−.164		−.287		~~−.268~~ −2.72		−.220		−.320		−.310	
31 48.8	31 38.2	31 —	32 12.1	31 42.9	31 32.3	31 39.3	31 30.6	32 35.4	32 29.6	32 35.1	32 29.4
50.9	40.5	—		45.0	34.2	41.3	32.1	37.4	31.4	37.4	31.0
53.0	42.0	—		47.0	36.1	43.5	34.0	39.5	33.7	39.4	32.2
57.1		—		57.2		47.6		43.8		43.6	
59.2		58.4 0.48		53.3		49.7		45.8		45.6	
1.2		0.4 .40		55.3		51.7		47.9		47.7	
3.3	32 22.8	2.5 .42		57.4	32 21.6	53.8	32 14.5	50.0	33 8.6	49.8	32 56.6
5.4	24.8	4.7 .54		59.4	23.8	56.0	16.0	52.0	11.2	51.9	58.5
9.5	27.0	9.0 .68		8.7	25.5	0.0	17.8	56.1	13.3	56.2	
11.6		11.0 .60		5.6		2.2		58.2		58.2	
13.7		13.1 .62		7.7		4.2		0.2		0.0	
3137		991		4285		3893		4663		4649	
300		60		180		180		60		60	
137	31 40.23	391	32 12.10	6085	31 34.20	5693	31 32.23	5263	32 31.57	5249	32 30.87
32 1.245	32 24.87	32 ~~5.586~~ 0.534		31 55.318	32 23.63	31 51.755	32 16.10	32 47.845	33 11.03	32 47.718	32 57.55
1.229		0.518		55.302		51.739		47.829		47.702	
+ 44.66		+ 46.38		+ 50.65		+ 53.97b		+ 1.44		+ 1.58	
+ .02		+ .04		+ .03		+ .03		+ .04		+ .04	
− 1.31	+1.781	− 1.30	+1.791	− 1.25	+1.841	− 1.19	+1.901	− 1.62		− 1.62	
+ 43.37		+ 44.12		+ 49.33		+ 52.80		− 0.14		0.00	
32 1.23		32 0.52		31 55.30		31 31.74		32 47.83		32 47.70	
32 44.60		32 44.64		32 44.63		32 44.54		32 47.69		32 47.70	
47.691		47.731		47.721		44.602 47.631					
+21.01	−23.63	−11.57		+21.12	−28.31	+19.52	−24.35	+16.27	−23.19	+16.85	−9.83
45		50		45		45		20		20	
−2.18		−2.19		−2.19		−2.12		−2.41		−2.38	
4 42.1	0 38.1	0 21.9		4 39.1	0 43.1	4 37.4	0 34.0	3 45.5	4 37.4	3 43.6	4 20.1
8.0	4.0	48.8		54.1	57.5	54.9	50.3	58.0	49.9	56.0	33.5
110.1	102.1	70.7		93.2	100.6	92.3	84.3	103.5	87.0	99.6	53.6
49 55.05	50 51.05	50 35.35		49 46.60	50 50.30	49 46.15	50 42.15	23 51.75	24 43.50	23 49.80	24 26.80
1.32243	1.37346n	1.06337n		1.32469	1.45194n	1.29048	1.38650n	1.21139	1.36530n	1.22660	0.99255
1.42882	1.47985n	1.16972n		1.43108	1.53833n	1.39295	1.48897n	1.33338	1.48729n	1.34859	1.11454
+26.84	−30.19	−14.78		+26.98	−36.17	+24.71	−30.83	+21.55	−31.42	+22.31	−13.02
50 21.89	50 20.86	50 20.57		50 13.58	50 13.13	50 10.86	50 11.32	24 13.30	24 12.08	24 12.11	24 13.78
−7° 27′ 33.54″	32.51	27 32.22		27 25.23	27 24.78	27 22.51	22.97	1 24.95	23.73	1 23.76	25.43
33.02				25.00		22.74		24.34		24.59	
+49 39 38	40 34					39 29	40 25	40 4	40 55		
1.83060	1.83080					1.83060	1.83080	1.83070	1.83090		
−1048		−554		−494		+67		−421		+197	
1.82012	1.82032	1.82506	1.82526	1.82566	1.82586	1.83127	1.83147	1.82649	1.82665	1.83267	1.83287
−66.09	−66.12	−66.84		−66.94	−66.97	−67.81	−67.84	−67.06	−67.09	−68.03	−68.06
+.03 −.19	+.04	+.01 ~~−.02~~ −.04		+.03 −.18	+.05	+.02 +.14	+.04	+.01 −.36	+.04	+.01 −.36	+.1
−.39	−.06	−.05		−.38	−.06	+.19	+.03	−.35	−.42	−.34	−.40
−1 6.45	−1 6.14	−1 6.88		−1 7.29	−1 6.98	−1 7.60	−1 7.71	−1 7.40	−1 7.47	−1 8.36	−1 8.45
−7 28 39.99	38.65	28 39.10		28 32.52	31.76	28 30.11	30.74	2 32.35	31.20	2 32.12	33.88
+10 22.17	20.52	+22.47	20.81	+16.01	14.35	+15.52	13.91	−16 6.48	8.31	−5.90	7.70
− 1.65	−9.12	− 1.66	−9.14	− 1.66	−9.38	− 1.61	−9.68	− 1.83		− 1.80	
+10.76		+10.74		+10.50		+10.20		+13.00		~~+13.02~~ +12.98	
+10 31.28	18 8.71	+ 31.55		+ ~~18.85~~ 24.85	7 ~~13.67~~	+ 24.11	6.00	−15 55.31	27.66	54.72	26.84
	7.37				~~14.91~~		6.63		26.51		28.60
					7						
	18 8.04	7.55			7 13.29		6.32	18	27.08		27.72
	18 24.92	29.43			~~26.17~~ 23.17 27.17		26.20				

1875

May 17				May 22				June 8			
-.349				-.425				-.485			
12 32	34.9	32	29.1	32	34.5	32	31.8	32	34.6	32	43.0
	36.9		30.9		36.6		33.2		36.7		46.4
	39.0		32.9		38.6		34.9		38.8		
	43.2				42.7						
	44.3				44.8						
	47.4				46.9						
	49.7				48.9	33	10.4		49.3		
	51.5				57.1		12.8		51.4		
	55.8				55.2		14.4		55.4		
	57.7				57.2				57.6		
	0.0				59.3				59.7		
	4604				5158						
	60										
	5204	32	30.97			32	33.30			32	44.70
32	47.309			32	46.891	33	12.53				
	47.293				46.875						
+	1.93			+	2.45			+	2.13		
+	.04			+	.05			+	.06		
−	1.60			−	1.57			−	1.45		
+	0.37			+	0.93			+	0.74		
32	47.29			32	46.87						
32	47.66			32	47.80						
					47.712						
	+16.34				+13.59		−25.64				
20				20				20			
	−2.216				−2.17						
3	43.2			3	51.0	4	42.1	4	2.2		
	55.8				7.0		57.3		20.9		
	99.0				118.0		99.4		23.1		
23	49.50			23	59.00	24	49.70	24	11.55		
1.21325				1.13322		1.40892					
1.33524				1.25521		1.53091					
	+21.64				+18.00		−33.96				
24	11.14			24	17.00	24	15.74				
1	22.79			1	28.65		27.39				
					28.02						
				40	11	41	1				
				1.83070		1.83090					
	+6.58				−13.61						
1.83728		1.83748		1.81709		1.81729					
	−68.75				−65.63		−65.66				
	+.01	~~−17~~ −.33			+.01	−.37	+.04				
	−.34				−.36		−.43				
−1	~~8.72~~	9.08		−1	5.98	−1	6.05				
2	31.87			2	34.63		33.44				
−16	6.87	8.58		−	5.61	7.25					
−	1.71			−	1.64						
	+12.90				+12.77				+12.20		
−15	55.68			−	54.48		29.11				
							27.92				
18	27.55						28.52				

Pr. # 6

ν Virginis, corr.= cond.=

h m sec
12 35 20

−0° 46′

γ = + 43° 9′
γring = +.68

tang δ = −.01 1,00
I = 2.06
K = −.015

1874
Apr. 30 35m 17.98 | 45′ 39.6
May 5 17.96 −.02 | 39.4 .2
10 17.94 .02 | 39.2 .2
15 17.92 .02 | 39.0 .2
20 17.89 .03 | 38.8 .2
25 17.86 .03 | 38.6 .2
30 17.83 .03 | 38.3 .3
June 4 17.80 .03 | 38.0 .3
9 17.76 .04 | 37.7 .3

1875
α 16.379
δ −45 29.90
dα/dt +3.038
dδ/dt −19.789

l cos δ ~~.00000~~ 9.99996
l b .10992
l b′ ~~.10992~~ .10988
l b′ ~~.10600~~ .10596
l sin δ 8.12647n

1875
19.617
−45 49.69
+3.038
−19.789

9.99996
~~.00000~~
.12552
~~.12552~~
.12548

× 1874 −.15 −.04 May 13 −.164
× −.25 −.05 May 14 34 −.287
× −.28 May 24 ~~−.268~~ −.272
+ 1875 −.29 June 2 −.220
1875 −.32 May 12 −.320
−.32 May 13 −.310

34 20.8 | 34 9.3 | 20.2 20.4 | 34 58.8 ✓ | 34 15.0 | 34 23.6 | 34 11.4 | 34 8.5 | 35 7.4 | 34 58.3 | 35 7.3 | 35 4.4
23.0 | 11.1 | 22.2 22.4 | | 17.0 | | 13.4 | 7.6 | 9.5 | | 9.3 | 6.1
25.0 | 16.9 | 24.4 24.6 | 35 3.6 ✓ | 19.1 | | 15.5 | | 11.6 | | 11.4 | 7.6
29.1 | 20.3 | 28.3 28.5 | | 23.2 | | 19.5 | | 15.7 | | 15.5
31.2 | | 30.4 30.6 | | 25.2 | | 21.6 | | 17.8 | | 17.7
33.3 | | 32.5 32.7 | | 27.3 | | 23.7 | | 19.8 | | 19.6
35.3 | 35 1.8 | 34.5 34.7 | 34 7.8 ✓ | 29.5 | 34 58.0 | 25.8 | 34 57.8 | 22.0 | 35 37.8 | 21.7 | 35 45.5
37.4 | 5.1 | 36.5 36.7 | | 31.5 | 35 1.5 | 27.9 | 56.2 | 24.0 | | 23.7 | 47.2
41.5 | | 40.7 40.9 | 34 11.9 ✓ | 35.5 | | 32.0 | | 28.2 | | 27.8 | 48.6
43.6 | | 42.8 43.0 | | 37.7 | | 34.1 | | 30.0 | | 29.9
45.7 | | 44.8 45.0 | | 39.6 | | 36.1 | | 32.2 | | 31.9

3659 | 34 14.40 | 3573 3595 | 34 11.90 | 3006 | 34 23.60 | 2610 | 34 5.55 | 2182 | 34 58.30 | 2158 | 35 ~~6.03~~
34 33.264 | 35 3.45 | 32.482 32.682 | 35 3.60 | 34 27.327 | 34 59.75 | 34 23.727 | 34 54.00 | 35 19.836 | 35 37.80 | 35 19.618 | 35 47.10

33.249 +44.72 | 32.467 32.667 +45.41 | 27.312 +50.56 | 23.72 +54.08 | 19.821 +1.47 | 19.603 +1.62
35 17.93 +00 | 35 17.92 17.92 +00 | 35 17.87 +00 | 35 17.81 +.00 | 35 21.29 +.00 | 35 21.29 +00
−44.68 −.04 | −45.45 −45.25 −.05 | −50.56 | −54.10 | −1.47 | −1.69
−1.35 | −1.34 | −1.29 | −1.23 | −1.67 | −1.67

+ 44.66 35m 16.58 + 45.39 | 16.49 ~~16.49~~ | + 50.55 16.58 | + 53.96 16.56 | + 1.44 19.62 | + 1.58 19.55
+ .00 | + .00 + .00 | + .00 | + .00 | + .00 | + .00
− 1.35 +1.688 | − 1.34 +1.698 − 1.34 +1.698 | − 1.29 +1.748 | − 1.23 +1.808 | − 1.67 | − 1.67
+ 43.31 | + 44.05 44.05 | + 49.26 | + 52.73 | − 0.23 | − 0.09
34 33.25 5.6073 | 34 32.47 | 34 32.67 55 5.848 | 34 27.31 5.334 | 34 23.71 55 5.111 | 35 19.82 29 .5389 | 35 19.60 5.440
+10 2255 | +10 2.292 | +10 1.626 | +10 1.582 | −16 5.93 | −16 5.46
35 16.56 −1.535 | 16.52 | 35 16.72 −1.4 | 35 16.57 −1.4 | 35 16.44 −1.4 | 35 19.59 −1.6 | 35 19.51 −1.6
19.598 +9.20 | 19.558 | 19.758 +9.10 | 19.608 +8.70 | 19.478 +8.20 | +11.50 | +11.50
−0 45 30.49 | 45 27.86 | 45 27.78 | 45 28.49 | 45 49.92 | 45 49.96

+18.86 −30.19 | +20.58 −31.12 | +3.73 −32.42 | +18.18 −30.27 | +21.54 −17.96 | +13.59 ∓27.48
15 −2.18 | 15 −2.19 | 15 −2.19 | 15 −2.12 | 50 −2.41 | 50 −2.38

2 25.0 3 22.3 | 2 14.0 3 19.8 | 2 37.5 3 23.7 | 2 14.9 3 16.0 | 1 12.6 2 5.9 | 2 20.0 —
49.8 47.8 | 41.0 45.9 | 49.2 36.1 | 30.5 31.9 | 26.9 19.9 | 30.3 —
74.8 70.1 | 55.0 65.7 | 86.7 59.8 | 45.4 47.9 | 39.5 25.8 | 50.3
17 37.40 18 35.05 | 17 27.50 18 32.85 | 17 43.35 18 29.90 | 17 22.70 18 23.95 | 51 19.75 52 12.90 | 52 ~~26.65~~ 25.15

~~1.27554~~ 1.47986 | 1.31345 1.49304 | 0.67171 1.51081 | 1.25959 1.48101n | 1.33325 1.25481 | ~~1.13322~~ 1.43902
1.38542 1.58974n | 1.42333 1.60292 | 0.68159 1.62069n | 1.36555 1.58694n | 1.45873 1.37979 | ~~1.25870~~ 1.56450
~~+24.29~~ −38.88 | +26.50 −40.08 | +4.80 −41.75 | +23.20 −38.63 | +28.76 −23.98 | ~~+18.14~~ ∓36.69
18 1.69 17 56.17 | 17 54.00 17 52.77 | 48.15 17 48.15 | 17 45.90 17 45.32 | 51 48.51 51 48.92 | ~~52 43.29~~ 51 48.46

−0° ~~55′ 1.334″~~ 55 7.82 | 55 ~~6.65~~ 5.02 4.43 | 59.80 59.80 59.80 | 54 57.55 57.26 54 56.97 | 29 0.16 0.36 0.57 | ~~28 54.94~~ 29 0.11

+43 7 20 8 18 | 7 6 8 7 | 7 32 8 25
1.73140 1.73160 | 1.73130 1.73150 | 1.73140 1.73160
−1040 | −554 | −483 | +76 | −421 | +205

1.72100 1.72126 | 1.72586 1.72606 | 1.72657 1.72677 | 1.73206 1.73226 | 1.72919 1.72939 | 1.73345 1.73365
−52.60 −52.63 | −53.19 −53.22 | −53.28 −53.30 | −53.96 −53.98 | −53.36 −53.38 | −54.13 −54.16

+.010 −.25 +.040 | 0 −.24 0 | 0 −.25 −.050 | −.010 +.12 −.040 | −.020 −.16 −.010 | −.010 −.040
−.21 −.29 | −.20 −.28 | −.22 −.28 | +.10 +.14 | −.12 −.20 | −.13 −.13
−52.81 −52.92 | −53.39 −53.50 | −53.50 −53.58 | −53.86 −53.84 | −53.48 −53.58 | −54.26 −54.29
56 6.15 56 0.74 | 59.04 57.93 | 55 53.30 53.38 | 51.41 50.81 | 29 53.64 54.15 | 49.20 29 54.40
45 39.1 | 39.0 | 38.6 | 38.1 | 46 1.2 | 1.2
+10 22.0? 21.6? | | 14.7 14.8 | 13.3 12.7 | −16 7.6 8.0 | 12.6?
+10 21.8 | 28.95 | 14.7 | 13.0 | 7.8 | 12.0?
+10 22.07 45 ~~36.26~~ | +22.47 20.99 ~~29.13~~ | +16.01 14.53 30.07 | +15.52 14.08 29.13 | −16 6.48 8.11 50.25 | − 5.90 7.51
− 1.48 20.69 30.85 | − 1.48 −10.69 ~~28.02~~ 27.85 | − 1.48 +1.09 30.15 | − 1.44 +1.59 28.53 | − 1.63 50.76 | − 1.61
+ 9.20 −10.59 | + 9.10 | + 8.70 | + 8.20 | + 11.50 | + 11.50
+10 29.89 45 30.85 | + 30.09 28.99 | + 23.23 30.11 | + 22.28 28.83 | −15 56.61 45 50.50 | − 56.01 ~~45.21~~
45 ~~53.34~~ 50.4 | 48.19 ~~48.26~~ | 49.90 | 48.62 | 50.41

1875

Apr.	30	35ᵐ	21.33ˢ		45′	61.7″	
May.	5		21.32	-.01		61.5	-.2
	10		21.30	.02		61.3	.2
	15		21.28	.02		61.1	.2
	20		21.25	.03		60.8	.3
	25		21.22	.03		60.6	.2
	30		21.19	.03		60.3	.3
June	4		21.15	.04		60.0	.3
	9		21.11	.04		59.7	.3

1875

-32 May 17 -3410 — -43 May 22 -425 — -1.50 June 8 -485

12 35 6.8 35 1.2 — 35 6.3 34 59.1 — 35 6.6 34 57.2
9.0 2.8 — 8.4 1.0 — 8.9 59.0
11.0 4.3 — 10.5 2.5 — 10.9 0.8
13.2 — 14.6 — 14.9
17.3 — 16.6 — 17.0
19.4 — 18.7 — 19.0
21.5 35 42.9 — 20.8 35 43.0 — 21.0 35 48.1
23.5 45.0 — 22.8 44.8 — 23.0 50.4
27.5 46.7 — 26.9 46.9 — 27.2 52.0
29.6 — 29.2 — 29.2
31.7 — 31.1 — 31.3

21 2 5 35 2.77 — 2059 35 0.87 — 2090 34 59.00
35 19.318 35 44.87 — 35 18.718 35 44.90 — 35 19.000 35 50.17

19.303 +1.96 — 18.703 +248 — 18985 +2.09
35 21.27 +00 — 35 21.24 +00 — 35 21.22 +.01
-1.97 — -2.54 — -2.14
-1.65 — -1.62 — -1.50
+ 1.93 35 19.61 — + 2.45 19.56 — + 2.13 19.58
+ .00 — + .00 — + .00
− 1.65 — − 1.62 — − 1.50
+ 0.28 — + 0.83 — + 0.63
35 19.30 29 4988 — 35 18.70 5284 — 35 18.98 5670
-16 647 — -16 557 — -16 559
35 19.58 -1.6 — 35 19.53 -1.6 — 35 19.61 -1.6
+1120 — + 1100 — +1000
-0 45 4675 — 45 4901 — 45 4789

+16.55 -25.55 — +17.85 -26.18 — +20.00 -31.17
50 — 50 — 50
1 -2.26 — -2.17 — -1.96
1 15.5 2 10.7 — 1 16.5 2 15.1 — 1 9.2 2 17.0
28.4 23.1 — 34.0 31.7 — 28.5 37.1
43.9 33.8 — 50.5 46.8 — 37.7 54.1
51 21.95 52 16.90 — 51 25.25 52 23.40 — 51 18.85 52 27.05

1.21880 1.40739ₙ — 1.25764 1.41797ₙ — 1.30103 1.49374ₙ
1.34428 1.53487ₙ — 1.37712 1.54345ₙ — 1.42651 1.61922ₙ
+22.09 -34.27 — +23.83 -34.95 — +26.70 -41.61
51 44.04 51 42.63 — 51 49.08 51 48.45 — 51 45.55 51 45.44

-28 55.69 54.28 — 29 0.73 0.10 — 28 57.20 57.09
54.98 — .0.41 — 57 14
7 31 8 29
1.73140 1.73160
+668 — -1343 — -477
1.73808 1.73828 — 1.71797 1.71817 — 1.72663 1.72683
-54.71 -54.74 — -52.24 -52.26 — -53.29 -53.31

-.01 -.17 -.03 — -.01 -.17 -.03 — -.02 -.26 -.04
-.13 -.21 — -.13 -.22 — -.18 -.34
-54.84 -54.95 — -52.37 -52.48 — -53.47 -53.65
29 50.53 49.23 — 53.10 52.58 — 50.67 50.74
46 0.9 — 46 0.7 — 45 59.7
-16 10.4 11.7 — 7.6 8.1 — 9.0 9.0
-16 11.0 — 7.9 — 9.0
-16. 6.87 8.40 47.73 — - 5.61 7.08 49.18 — - 5.73 7.06 47.73
- 1.53 46.43 — - 1.47 48.66 — - 1.33 47.80
+ 11.20 — + 11.00 — + 10.00
-15 57.20 45 47.08 — - 56.08 48.92 — - 57.06 47.76

60 B Canum

~~B. A. C. 4287.~~

12h 39m 15sec.

+46° 8'

ζ = − 3° 45'

sin ζ = −.06

	1874	1875
α		39 15.12
δ		7 26.89
dα/dt		+2.835
dδ/dt		−19.74
l cos δ	9.84072	9.84072
l b	.10992	.12552
l b'	9.95064	9.96624
l b'	9.94672	
l sin δ	9.85791	

cons α =
cons δ =
tang δ = +1.04
I = 2.97 s
K = −.022 s

1874 May 13		May 14		May 24		1874 June 2		1875 May 12		May 13	
.164		−.287		~~.268~~ −2.72		−.220		−.320		−.310	
38 12.3	38 1.4	38 11.6	37 59.6	38 6.3	37 50.7	38 2.7	37 48.0	38 59.0	38 55.5	38 58.5	38 49.0
15.3	3.7	14.5	2.3	9.2	53.8	5.6	50.1	39 1.9	57.5	39 1.1	51.4
242 18.3	4.0	17.5	4.8	12.4	55.9	8.6	53.7	4.9	0.3	4.6	53.8
27.1		23.3		18.2		14.6		10.8		10.6	
30.1		26.4		21.2		17.6		13.6		13.6	
33.0		29.3		24.2		20.4		16.9		16.6	
36.0	38 30.5	32.4	38 49.9	27.2	38 52.5	23.5	38 43.4	19.5	39 36.9	19.5	39 33.4
42.0	32.9	35.4	53.2	30.2	55.6	26.5	46.7	22.6	40.3	22.5	36.1
45.0	35.7	41.3	53.9	36.1	58.0	32.5	49.5	28.6	43.4	28.4	38.4
48.0		44.3		39.0		35.3		31.4		31.5	
		47.3		42.1		38.3		34.5		34.4	
3313	38 3.03	3233	38 ~~37~~ 2.23	2661	37 53.47	2256	37 50.60	2435		2419	
38 30.118	38 53.03	38 29.391	38 53.00	38 24.191	38 55.37	38 20.509	38 46.53	60		60	
								1835	38 57.60	1819	38 51.40
								39 16.682	39 40.20	39 16.536	39 35.97
30.096		29.369		24.169		20.487		16.660		16.514	
+ 44.66		+ 45.39		+ 50.55		+ 53.96		+ 1.44		+ 1.58	
− .17		− .30		− .28		− .23		− .33		− .32	
− 2.27	+0.565	− 2.25	+0.585	− 2.12	+0.715	− 1.97	+0.865	− 2.66		− 2.65	
+ 42.22		+ 42.84		+ 48.15		+ 51.76		− 1.55		− 1.39	
38 30.10		38 29.37		38 24.17		38 20.49		39 16.66		39 16.51	
39 12.32	+2.05	39 12.21	+0.585	39 12.32		39 12.25		39 15.11		39 15.12	
15.155		15.645		15.155		12.275	15.085				

	20 +27.09	−22.91	20 +27.16	−23.61	20 +30.72	−31.18	20 +29.91	−26.02	55 +19.08	−23.52	55 +25.14	−19.43
	−12.18		−2.19		−2.19		−2.12		−2.41		−2.38	
	4 53.1	0 36.2	4 52.9	0 37.9	4 47.5	0 41.9	4 45.1	0 34.1	3 54.1	4 32.3	3 48.3	4 27.9
	12.2	55.7	13.0	57.9	53.9	49.0	54.6	43.8	12.0	49.2	6.3	46.5
	125.3	91.9	125.9	95.8	101.4	90.9	99.7	77.9	126.1	81.5	114.6	79.4
	25 2.65	25 45.95	25 2.95	25 47.90	24 50.70	25 45.45	24 49.85	25 38.95	59 3.05	59 40.75	58 57.30	59 37.70
	1.43281	1.36003n	1.43393	1.37310n	1.48742	1.49388n	1.47582	1.41531	1.28058	1.37144n	1.46037	1.28847n
	1.38345	1.31067n	1.38457	1.32374n	1.43806	1.44452n	1.42254	1.36208n	1.24682	1.33768n	1.36661	1.25471n
	+24.18	−20.45	+24.24	−21.07	+27.42	−27.83	+26.46	−23.02	+17.66	−21.76	+23.26	−17.98
	25 26.83	25 25.50	25 27.19	25 26.53	25 18.12	25 17.62	25 16.31	25 15.93	59 20.71	59 18.99	59 20.56	59 19.22
√ − δ° +45	57 21.52 22.18	22.85	57 21.16 21.34	21.52	57 30.23 30.48	30.73	57 32.04 32.23	32.42 ~~32.03~~	23 27.64 25.50	29.36	23 27.79 28.46	~~31.63~~ 29.18
− 3.	45 15	44 31					45 37	44 38	44 45	44 7		
	0.57750n	0.57590n					0.57800n	0.57610	0.57650n	0.57510n		
	−10216		−554		−462		+91		−421		+218	
	.56724	.56564	.57196	.57036	.57288	.57128	.57891	.57701	.57229	.57089	.57868	.57728
	+3.69	+3.68	+3.73	+3.72	+3.74	+3.73	+3.79	+3.78	+3.73	+3.72	+3.79	+3.78
	−.20 −.19	−.13	−.20 −.20	−.15	−.25 −.47	−.36	−.23 −.10	−.18	−.10 −.51	−.14	−.17 −.51	−.10
	.00	−.06	.00	−.06	−.38	−.06	+.19	+.02	−.36	−.42	−.35	−.41
	+ 3.49	+ 3.49	+ 3.53	+ 3.51	+ 3.11	+ 3.41	+ 3.75	+ 3.62	+ 3.27	+ 3.16	+ 3.27	+ 3.27
+45	57 25.01	26.34	57 24.69	25.03	57 33.34	34.14	57 35.79	36.04	23 31.91	32.52	23 31.06	32.40
	+10 22.17	22.30	+ 22.47	22.60	+ 16.01	16.14	+15.52	15.65	−16 6.48	6.34	−16 5.90	5.76
	+ .13	−22.32	+ .13	−22.51	+ .13	−24.27	+ .13	−25.59	+ .14		+ .14	
	−2.58		−2.77		−4.53		−5.85		−0.10		− 0.29	
	+10 19.72	7 44.73	+ 19.83	44.52	+ 11.61	44.95	+ 9.80	45.57	−16 6.44	24.47	−16 6.05	25.01
		46.06		44.86		45.75		45.84		26.08		26.35
		7 45.39		44.69		45.35		45.72		25.27		25.68
		7 25.65		24.98		25.61		25.98				

1875

May 17				May 27				June 8			
	−.340				−.510				+.485		
12 38	58.2	38	45.2	38	57.0	38	47.4	38	58.0	38	46.6
39	1.2		46.8	39	0.0		49.4	39	1.0		49.6
	4.3		49.1		2.9		52.3		4.0		51.1
	10.1				8.9				9.9		
	13.2				11.7				12.8		
	16.1				14.7				15.8		
	19.0	39	38.1		17.8	39	35.8		18.9	39	28.4
	22.2				21.0		39.7		21.8		30.2
	28.1				26.8		42.6		27.8		33.1
	30.9				29.7				30.7		
	33.9				32.6				33.9		
	2372				2231				2346		
	60				60				60		
	1772	38	47.03		1631	38	49.70		1746	38	49.10
39	16.109	39	38.10	39	14.827	39	39.37	39	15.873	39	30.90
											30.57
	16.087				14.805				15.851		
+	1.93			+	3.29			+	2.13		
−	.35			−	.53			−	.50		
−	2.60			−	2.40			−	2.25		
−	1.02			+	0.31			−	0.62		
39	16.09			39	14.80			39	15.85		
39	15.07			39	15.11			39	15.23		
									15.128		
	+29.08		−21.99		+25.13		−24.54		+26.77		−14.70
55				55				55			
	−2.26				2.07				−1.96		
3	43.5	4	30.8	3	43.3	4	29.7	3	39.3	4	18.2
	59.9		45.5		9.1		54.6		2.7		42.4
	1034		763		1124		843		1020		606
58	51.70	59	38.15	58	1.20 56.20	59	42.15	58	51.00	59	30.30
	1.46359		1.34223		1.40019		1.38987		1.42765		1.16732n
	1.42983		1.30847n		1.36643		1.35611n		1.39389		1.13356n
	+26.91		−20.35		+23.25		−22.70		+24.77		−13.60
59	18.61	59	17.80	59	19.45	59	19.45	59	15.77	59	16.70
23	29.74		30.55	23	28.90		28.90	23	32.58		31.65
	30.14				28.90				32.11		
								44	57	44	18
									0.57670n		0.57550n
	+684				−725				−59		
	.58384		.58194		.56925		.56785		.57611		.57491
	+3.83		+3.82		+3.71		+3.70		+3.77		+3.76
	−.23 −.56		−.13		−.17 −.55		−.16		−.19 −.70		−.05
	−.35		−.41		−.35		−.42		−.53		−.63
	+3.25		+3.28		+3.19		+3.12		+3.05		+3.08
23	32.99		33.83	23	32.09		32.02	23	35.63		34.73
−16	−6.87		6.74	−	4.01		3.89	−	5.73		5.61
+	.13			+	.12			+	.12		
	−1.05				−2.70				−4.27		
−16	7.49		25.20	−	6.59		25.50	−	9.88		25.75
			26.04				25.43				24.85
			25.62				25.46				25.30

1874 1875

35 Virginis
h m sec
12 41 29
+4° 16'

α
δ
dα/dt
dδ/dt

41 29.59
15 18.21
+3.054
−19.74

corr α =
corr δ =

tang δ = +.08
I = 2.07 s
K = −.015 s

ʒ = +38 07
sin ʒ = +.62

l cos δ 9.99879 9.99879
l c .10972 .12552
l c' .10871 .1 ~~4~~ 2 431
l c' .10479
l sin δ 8.87156

1874 1874 1875

May 13 May 14 May 24 June 2 May 12 May 13

−.164 −.287 ~~−.268~~ −2.72 −.220 −.320 −.310

40 30.9 40 20.1 40 30.2 40 12.5 40 25.0 40 19.5 40 21.4 40 7.3 41 17.4 41 9.0 41 — 41 39.7
33.0 22.2 32.2 14.8 27.0 21.8 23.4 9.0 19.5 10.6 — 41.2
35.0 23.8 34.3 16.1 29.1 23.3 25.5 10.5 21.6 12.8 — 43.0
39.1 38.3 33.2 27.6 25.7 25.6
41.2 40.4 35.3 31.7 27.7 27.6
43.2 42.5 37.4 33.7 29.9 29.7
45.3 40 52.9 44.6 40 56.8 39.4 40 51.4 35.8 40 52.4 31.8 41 43.1 31.4
47.3 1 54.8 46.6 59.0 41.5 54.1 38.0 54.3 34.0 45.9 38.9
51.6 56.4 50.9 0.8 45.7 53.5 42.1 56.4 38.2 48.1 —
53.6 52.9 47.7 44.1 40.2 —
55.7 55.0 49.8 46.2 42.4 —

47.59 40 22.03 46.79 40 14.47 41.11 40 21.53 37.15 40 8.93 32.84 41 10.80 14.85 41 41.13
40 43.264 40 54.70 40 42.536 40 38.87 40 37.373 40 53.67 40 33.773 40 54.37 41 29.855 41 45.70 41 29.700

43.249 42.521 37.358 33.758 29.840 29.685

+ 44.67 + 45.39 + 50.56 + 53.96 + 1.45 + 1.59
− .01 − .02 − .02 − .02 − .02 − .02
− 1.43 +1.624 − 1.43 +1.624 − 1.34 +1.684 − 1.30 +1.754 − 1.76 − 1.76
+ 43.23 + 43.94 + 49.16 + 52.64 − 0.33 − 0.19
40 43.25 40 42.52 40 37.36 40 33.76 41 29.84 41 29.68

41 26.48 41 26.46 41 26.52 41 26.40 41 29.51 41 29.49
29.534 29.514 29.574 29.454
26.465

+21.23 −11.44 +28.07 −16.33 +15.84 −16.30 +24.84 −20.60 +19.05 −15.85 −11.48
15 15 15 15 50 50

−2.18 −2.19 −2.19 −2.12 −2.41 −2.38

1 13.8 1 56.1 1 4.2 1 1.0 1 17.9 1 0.0 0 3.7 1 1.7 0 11.9 0 59.4 0 53.5
36.7 17.7 27.9 24.8 29.4 10.4 16.9 14.9 27.9 15.5 9.4
50.5 13.38 32.1 25.8 47.3 10.4 20.6 16.6 39.8 134.9 122.9
16 25.25 ~~16~~ 17 6.90 16 16.05 ~~16~~ 17 12.90 16 23.65 ~~16~~ 17 5.20 15 (16) 10.30 16 (17) 8.30 50 19.90 51 7.45 51 1.45

1.32695 1.05843n 1.44824 1.21299n 1.19976 1.21219n 1.39515 1.31387n 1.27989 1.20003n 1.05805n
1.43566 1.16714n 1.55695 1.32170n 1.30847 1.32090n 1.49994 1.41866n 1.40420 1.32434n 1.18236n
+27.27 −14.69 +36.05 −20.97 +20.35 −20.94 +31.62 −26.22 +25.36 −21.11 −15.22
16 52.52 16 52.21 16 52.10 16 51.98 16 44.00 16 44.26 16 41.92 16 42.08 50 45.26 50 46.34 50 46.23

° ' "
+4 5 55.83 56.14 5 56.25 56.42 6 4.35 4.09 6 6.43 6.27 32 3.09 2.01 32 2.12
55.98 56.33 4.22 6.35 2.55

+38 6 8 6 50 5 53 6 51 6 32 7 19
1.65440 1.65460 1.65440 1.65460 1.65450 1.65470

−1020 −554 −456 +97 −421 +223
1.64420 1.64440 1.64886 1.64906 1.64984 1.65004 1.65537 1.65557 1.65029 1.65049 1.65673 1.65693
−44.08 −44.10 −44.55 −44.57 −44.65 −44.67 −45.22 −45.24 −44.70 −44.72 −45.37

−.02 −.15 −.01 −.04? −.12 −.01 −.01 −.11 −.01 −.03 +.04 −.02 −.02 −.08 −.01 −.01 ~~−.05~~ −.10
−.11 −.17 −.10 −.10 −.11 −.09 +.05 +.08 −.03 −.10 −.09
−44.21 −44.28 −44.74 −44.68 −44.77 −44.77 −45.20 −45.18 −44.75 −44.83 −45.47
+4 5 11.62 11.86 5 11.56 11.74 5 19.58 19.32 5 21.23 21.09 31 18.34 17.18 31 16.65
+10 22.17 20.82 +10 22.47 21.12 +10 16.01 14.66 +10 15.52 14.21 − 6.48 7.97 − 5.90 7.37
− 1.35 −11.60 − 1.35 −11.66 − 1.35 −12.36 − 1.31 −13.01 − 1.49 − 1.47
+8.14 +8.08 +7.38 +6.73 +10.49 +10.43

+10 28.96 15 40.58 + 29.20 40.76 + 22.04 41.62 + 20.94 42.17 − 15 57.98 20.86 − 56.94
40.82 40.94 41.36 42.03 19.70

15 40.70 40.85 41.49 42.10 15 20.28 19.72
15 20.96 21.11 21.75 22.36

1875

May 17		May 22		May 27		May 29	
−.340		−.425		−.570		−.488	
12 41 16.7	41 8.3	41 16.6	41 11.8	41 15.5	41 7.2	41 15.9	41 7.9
19.0	10.2	18.6	13.6	17.7	8.6	18.0	10.0
21.2	12.0	20.6	15.4	19.8	10.9	20.0	11.9
25.2		24.7		24.0		24.0	
27.3		26.8		25.9		26.0	
29.4		28.9		28.0		28.1	
31.5	41 42.4	30.9	41 38.0	30.0	41 43.4	30.3	41 45.4
33.5	44.8	33.0	40.0	32.1	45.5	32.4	47.2
37.7	46.5	37.1	42.0	36.2	47.5	36.6	49.0
39.8		39.2		38.2		38.6	
41.8		41.3		40.4		40.6	
32.33	41 10.17	31.77	41 13.60	30.78	41 8.90	31.05	41 9.93
41 29.391	41 44.57	41 28.882	41 40.00	41 27.982	41 45.47	41 28.227	41 47.20
29.376		28.864		27.967		28.212	
+ 1.93		+ 2.46		+ 3.29		+ 3.11	
− .03		− .03		− .04		− .04	
− 1.74		− 1.71		− 1.68		− 1.66	
+ 0.16		+ 0.72		+ 1.57		+ 1.41	
41 29.38		41 28.87		41 27.97		41 28.21	
41 29.54		41 29.59		41 29.54		41 29.62	
						29.548	
s							
50 +19.22	−15.18	50 +15.28	−11.12	50 +19.08	−17.49	50 +18.30	−18.97
−2.26		−2.17		−2.07		−2.06	
0 10.1	0 56.9	0 17.9	0 53.5	0 11.7	0 59.0	0 10.5	0 59.9
25.9	12.1	38.1	11.9	34.7	23.0	31.9	20.7
36.0	129 0	56 0	125 4	46 4	142 0	42 4	140 6
50 18.00	51 4.50	50 28.00	51 2.70	50 23.20	51 11.00	50 21.20	51 10.30
1.28375	1.18127n	1.18412	1.04610n	1.28058	1.24279n	1.26245	1.27807n
1.40806	1.30558n	1.30843	1.17041n	1.40489	1.36710n	1.38676	1.40238n
+25.59	−20.21	+20.35	−14.81	+25.40	−23.29	+24.37	−25.26
50 43.59	50 44.29	50 48.35	50 47.89	50 48.60	50 47.71	50 45.57	50 45.04
32 4.76	4.06	32 0.00	0.46	31 59.75	0.64	32 2.78	3.31
4.41		0.23		0.19		3.04	
						6 33	7 22
						1.65450	1.65470
+692		−1299		−713		−315	
1.66142	1.66162	1.64151	1.64171	1.64737	1.64757	1.65135	1.65155
−45.86	−45.88	−43.81	−43.83	−44.40	−44.42	−44.81	−44.83
−.02 −.08	−.01	−.01 −.07	−.01	−.02 −.09	−.01	−.01 −.12	−.02
−.03	−.10	−.04	−.09	−.04	−.11	−.04	−.17
−45.91	−45.99	−43.86	−43.93	−44.46	−44.54	−44.86	−45.02
31 18.85	18.07	31 16.14	16.53	31 15.29	16.10	31 17.92	18.29
−16 6.87	8.27	− 5.61	6.95	− 4.01	5.29	− 5.28	6.55
− 1.40		− 1.34		− 1.28		− 1.27	
+10.15		+9.79		+9.40		+9.24	
−15 58.12	15 20.73	− 57.16	18.98	− 55.89	19.40	− 57.31	20.61
	19.95		19.37		20.21		20.98
	15 20.34		19.17		19.80		~~21.07~~ 20.80

1874

31 Comae.
12h 45m 36sec.
+ 28° 14'
ζ = + 13° 9'
ping = ~~+~~.244

ℓcos δ 9.94499
ℓc .10992
ℓc' .05491
ℓc' .05099
ℓsin δ 9.67492

cons =
cons δ =
tang δ = +.54
I = 2.34 s
K = -.018

1874

	May 13		May 14		May 24		June 2		June 8		June 9	
	-.164		.287		~~.268~~ -2.72		-.220		-.324		-.420	
	44 36.7	44 29.0	44 35.9	44 26.8	44 30.8	44 21.8	44 27.2	44 15.3	44 24.8	44 22.2	4~~4~~ 5 —	4~~4~~ 5 39.7
	39.1	31.0	38.3	29.2	33.1	24.2	29.6	18.1	27.3	24.0	—	
	41.4	32.7	40.7	31.3	35.5	25.8	32.0	20.5	30.0	26.4	—	
	46.1		45.3		40.1		36.6		—		34.1	
	48.4		47.7		42.5		38.9		—		36.6	
	50.8		50.1		44.8		41.2		—		38.8	
	53.2		52.5		47.1	45 11.6	43.5	45 6.4	—		41.2	
	55.4	45 13.1	54.7	44 56.6	49.5	14.2	46.0	8.7	—		43.5	
	0.1	15.7	59.5	58.8	54.3	16.0	50.6	11.0	48.2		—	
	2.5	17.2	1.7	1.0	56.5		53.0		50.5		—	
	4.8		4.2		58.9		55.3		52.8		—	
	3785		4306		4931		4539				1942	
	180		120									
	55585	44 30.90	5506	44 29.10		44 23.93		44 17.97		44 24.20		4~~4~~ 5 39.70
	44 50.773	45 15.13	44 50.055	44 58.80	44 44.827	45 13.93	44 41.264	45 8.70	38.933		4~~4~~ 5 38.840	
	50.755		50.037		44.809		41.248		44 38.915		5 38.822	
	+ 44.67		+ 45.39		+ 50.65		+ 53.96		+ 56.48		- 3.45	
	- .09		- .15		- .15		- .12		- .17		- .23	
	- + 1.78	+1.151	- + 1.78	+1.151	- + ~~1.68~~ .70	+1.231	- + 1.61	+1.321	- + 1.55	+1.381	- + 1.64	+1.391
	+ ~~46.36~~	42.80	+ ~~47.02~~	43.46	+ ~~52.10~~	49.70	+ ~~53.45~~	52.23	+ ~~57.86~~	54.76	- ~~2.14~~	-5.22
	44 50.75		44 ~~50.04~~	50.04	44 ~~44.81~~	44.81	44 ~~41.25~~	41.25	44 38.91	38.91	4~~4~~ 5 38.82	38.82
	45 ~~37.11~~ 33.55		45 ~~37.06~~	33.50	45 ~~36.91~~	33.51	45 ~~36.70~~	33.48	45 ~~36.77~~	33.67	4~~4~~ 5 ~~36.68~~	33.60
	36481			36431		36441		36411		36601		36531
												33.552

	May 13		May 14		May 24		June 2		June 8		June 9	
	15 +19.87	-24.36	15 +20.95	-8.75	15 +20.90	-29.10	15 +23.29	-27.44	15 +14.73		15 -0.86	
	-2.18		-2.19		-2.19		-2.12		-2.07		-2.06	
	3 49.8	4 40.0	3 48.1	4 21.2	3 46.0	4 42.7	3 40.9	4 37.6	3 50.5		~~3~~ 4 8.8	4 52.1
	8.9	57.9	8.0	40.4	5 2.8	48.1	48.2	45.9	7.4		26.3	9.0
	1187	979	1161	616	9 8.8	908	891	835	1179		351	1211
	18 59.35	19 48.95	18 58.05	19 30.80	18 49.40	19 45.40	18 44.55	19 41.75	18 58.95		~~18~~ 9 17.55	19 0.55
	1.29820	1.38668	1.32118	0.94201	1.32015	1.46389	1.36717	1.43838	1.16820		9.93450	
	1.35311	1.44169	1.37609	0.99692	1.37506	1.57880	1.41816	1.48937	1.21919		9.98549	
	+22.55	-27.64	+23.77	-9.93	+23.72	-33.02	+26.19	-30.86	+16.56?		-0.97	
	19 21.90	19 21.31	19 21.82	19 20.87	18 9 13.12	19 12.58	19 10.74	19 10.89	~~18 42.39~~ 19 15.51		~~18~~ 9 16.58	
+28°	3 26.45	27.04	3 26.53	27.48	4 3 35.23	35.97	3 37.61	37.46	3 32.84		~~4~~ 3 31.77	
	26.74		27.60		35.60		37.53					
+13 14	8 42	9 32					8 27	9 25				
	1.~~12860~~ 16180	1.~~12910~~ 1.16210					1.~~12850~~ 16120	1.~~12900~~ 1.16202				
	-1006		-554		-436		+111		-1999		-1814	
	1.15174	1.15204	1.15626	1.15656	1.15744	1.15774	1.16281	1.16311	1.14171	1.14201	1.14356	1.14386
	-14.18	-14.19	-14.33	-14.34	-14.37	-14.38	-14.55	-14.56	-13.86		-13.92	-13.93
	-.08	-.45 -.13	-.09	-.39 - 2	-.09	-.48 -.19	-.12	+.03 -.16	-.05	~~+.05~~	- 0	-.03
	-.32	-.38	-.32	-.36	-.30	-.38	+.15	+.19	+.16	+.11	-.13	~~-.16~~
	-14.58	-14.70	-14.74	-14.72	-14.76	-14.95	-14.52	-14.53 - *	13.75		-√ -13.95	
+28	3 11.87	12.34	3 11.79	12.76	3 20.47	21.02	3 23.09	22.93	3 19.09		3 17.82	
+10	22.17	21.65	+22.47	21.95	+16.01	15.49	+15.52	15.02	+18.85	18.36	+19.69	19.20
	+2.23	-17.45	+2.08	-17.60	+0.60	-19.08	-0.54	-20.25	-1.26	-20.94	-1.86	-21.04
	- 52	13 35.75	- 52	35.82	- 52	36.56	- 50	37.54	- 49		- 49	
+10	23.88	36.22	+ 24.03	36.79	+ 16.09	37.11	+ 14.45	37.38	+ 17.10		+ 17.84	
		13 35.98		36.20		36.68		37.46		36.19		35.66
		16.30		16.62		17.15		17.78		16.51		15.98

1875
α 45 36.53
δ 13 16.28
$\frac{d\alpha}{dt}$ + 2.931
$\frac{d\delta}{dt}$ − 19.68

l cos δ 9.94499
l 6 .12552
l 6′ .07051

1875

May 12

−.320

45	23.4	45	16.9
	25.9		18.2
	28.1		20.4
	32.7		
	35.0		
	37.2		
	39.6	46	1.0
	41.9		3.2
	46.6		5.3
	49.0		
	51.3		
	4105	45	18.50
45	37.318	46	3.17

37.300

+ 1.59 45
− .17
− 2.14
− 0.86
45 37.30

45 36.44

May 13

Ch f

May 17

−.340

45	22.8	45	14.2
	25.0		16.2
	27.6		17.9
	32.0		
	34.5		
	36.8		
	39.1	45	51.2
	42.5		
	46.1		
	48.5		
	51.0		
	4049	45	16.10
45	36.809	45	51.20

36.791

+ 1.93
− .18
− 2.10
− 0.35
45 36.79

45 36.44

May 22

−.425

	—	45	35.9
	—		58.1
	—		0.1
	31.6		
	33.9		
	36.3		
	38.6		
	40.9		
	—		
	—		
	—		
	1813	45	58.03
45	36.260		

36.242

+ 2.46
− .23
− 2.06
+ 0.17
45 36.24

45 36.41

May 27

−.510

45	21.4	~~45~~ 46	3.0
	23.8		5.1
	26.0		7.0
	30.8		
	33.1		
	35.4	46	46.7
	37.8		49.0
	40.2		51.8
	44.9		
	47.4		
	49.8		
	3905	45 6	5.03
45	35.500	46	49.17

35.482

+ 3.29
− .27
− 2.02
+ 1.00
45 35.48

45 36.48

May 29

−.488

45	21.8	45	18.1
	23.9		19.6
	26.2		21.5
	31.0		
	33.2		
	35.6		
	38.0	45	56.5
	40.3		58.9
	44.5		0.9
	47.5		
	49.7		
	3917	45	19.73
45	35.609	45	58.77

35.591

+ 3.11
− .26
− 2.00
+ 0.85
45 35.59

45 36.44

36.442

S

May 12			May 17		May 22	May 27		May 29	
+ 18.82	− 25.85		+ 20.71	− 14.39	− 21.77	+ 30.47	− 13.67 4 1	+ 15.88	− 23.16
50	50		50		50	50		50	
− 2.41			− 2.26		− 2.17	− 2.07		− 2.06	
2 43.9	3 35.4	2 42.3	2 39.7	3 21.1	3 30.7	2 27.0	3 19.6	2 43.0	3 29.7
0.7	52.4	59.5	54.8	38.8	49.9	51.3	43.2	6.0	50.3
1046	878	1018	945	599	806	783	628	1090	800
52 52.30	53 43.90	52 50.90	52 47.25	53 29.95	53 40.30	52 39.15	53 31.40	52 54.50	53 40.00
1.27462	1.41246n		1.31618	1.15806	1.33786n	1.48387	1.35777 ~~1.36729n~~	1.20085	1.36474n
1.34513	1.48297n		1.38669	1.22857n	1.40837n	1.55438	~~1.93780n~~ 2.06781	1.27136	1.43525n
+22.14	−30.40		+ 24.36	−16.93	−35.61	+35.84	− [illegible]	+18.68	−27.24
53 14.44	53 13.50		53 11.61	53 13.02	53 14.69	53 14.99	53 ~~16.08~~ ~~7.74~~ 16.32	53 13.18	53 12.76
29 33.91	34.85		29 36.74	35.33	29 33.66	29 33.36	33.03	29 35.17	35.59
34.38			36.08 3			33.19		35.38	
9 4	9 56							9 6	9 52
~~1.12890~~	~~1.12930~~							~~1.12890~~	~~1.12930~~
1.16190	1.16232							1.16190	1.16230
−421			+708		−1281	−685		−301	
1.15769	1.15809		1.16898	1.16938	1.14905	1.15505	1.15545	1.15889	1.15929
−14.38	−14.39		−14.76	−14.77	−14.10	−14.29	−14.30	−14.42	−14.43
−.08 −.40	−.14		−.09 −.35 5	−.05	−.10	−.20 −.39	−.04	−.05 −.55	−.12
−.236	−.30 3		−.22	−.28 32	−.28 33.21 −.43	−.10 23	.10 −31	−.12 −41	−.30 −52
−14.72	−14.86		−15.10	−15.14	−14.53	−14.72	−14.65	−14.88	−15.07
29 19.19	19.99		29 21.64	20.19	29 19.13	29 18.64	18.38	29 20.29	20.52
−16 6.48	7.05		−16 6.87	7.41	− 5.61	− 4.01	4.50	− 5.28	5.77
+4.69			+3.91		+3.18 6.13	+2.50		+2.24	
− .54	13 16.83		− .54	18.14	− .52	− .49	16.64	− .49	16.76
−16 2.36	17.63		−16 3.70 5	16.69	− 2.95	− 2.00	16.38	− 3.53	16.99
	13 17.23			17.42	16.18		16.51		16.87

8

ε Ursæ Majoris
12 48m 31sec
+ 56° 38′
z = − 14° 15′
sin z = −.25

1874					
Apr.	30	48m 31.90s		38′ 38.7″	
May	5	31.83	−.07	39.9	+1.2
	10	31.76	.07	41.1	1.2
	15	31.67	.09	42.1	1.0
	20	31.58	.09	43.1	1.0
	25	31.48	.10	44.0	.9
	30	31.37	.11	44.8	.8
June	4	31.25	.12	45.5	.7
	9	31.13	.12	46.1	.6

1874
α 28.819s
δ +38′ 37.59″
dα/dt +2.661s
dδ/dt − 19.650

corr α =
corr δ =
tang δ = +1.52 1.82
I = 3.74s
k = −.028s

l cos δ 9.74036
l c 10992
l c′ 9.85028
l c′ 9.84636
l sin δ 9.92177

× 1874 May 13 −.15 −.04 −.164 | May 14 | × May 24 −.28 ~~−.268~~ −.272 | × June 2 −.29 −.220 | + June 8 −.42 −.324 | + June 9 −.42 −.420

47 24.8 47 6.7 | 47 19.0 47 31.8 | 47 15.2 47 8.1 | 47 12.7 47 5.5 | 47 12.7 47 9.0
28.5 10.3 | 22.7 35.5 | 18.9 6.1 | 16.5 9.1 | 16.4 12.0
32.4 13.0 | 26.5 38.5 | 22.7 8.3 | 20.3 12.2 | 20.2 15.6
39.8 | 34.0 | 30.2 | 27.8 | 27.8
43.6 | 37.6 | 34.0 | 31.4 | 31.5
47.4 | 41.5 | 37.8 | 35.2 | 35.2
51.2 48 8.7 | 45.1 48 13.8 | 41.7 48 4.4 | 38.9 47 47.0 | 39.0 48 2.8
54.8 11.8 | 48.9 18.0 | 45.3 8.9 | 42.8 51.6 | 42.9 7.5
2.3 15.2 | 56.5 21.3 | 52.7 12.4 | 50.5 55.0 | 50.2 11.3
6.1 | 0.2 | 56.7 | 54.1 | 53.8
9.8 | 4.1 | 0.3 | 57.7 | 57.7

3407 | 3361 | 3555 | 3879 | 3874
180 | 120 | 60
5207 47 10.00 | 4561 47 35.27 | 4155 47 5.83 | 47 8.93 | 47 12.20
47 47.336 48 11.90 | 47 41.464 48 17.70 | 47 37.773 48 8.57 | 47 35.264 47 51.20 | 47 35.218 7.20
47.308 +44.73 | 41.434 +50.56 | 37.745 +54.08 | 35.234 +56.57 | 35.190 +56.55
48 31.71 −.23 | 48 31.50 49 −.43 | 48 31.34 29 −.44 | 48 31.167 −.64 | 48 31.14 12 −.64
−44.40 −.07 | −50.076 | −53.60 55 | −55.934 | −55.983
−.289 | −.267 | −.247 | −.235 | −.230

+ 44.657 48 28.85 | + 50.55 28.89 | + 53.97 28.91 | + 56.478 28.81 | − 3.45 28.50
− .25 | − .41 | − .33 | − .49 | − .64
− 2.89 −0.229 | − 2.67 −0.001 | − 2.47 +0.191 | − 2.35 +0.311 | − 2.30 +0.361
+ 41.53 | + 47.47 | + 51.17 | + 53.64 | − 6.39
47 47.31 28 19.93 | 47 41.43 28.74 | 47 37.74 30.83 | 47 35.23 26.87 | 48 35.19 26.07
+10 22.55 | +10 16.26 | +10 15.82 | +10 19.60 | +10 20.11
48 28.84 +.6 | 48 28.90 +.5 | 48 28.91 +.6 | 48 28.87 +.5 | 48 28.80 +.6
31.501 −4.20 | 31.561 −6.20 | 31.571 −7.70 | 31.531 −8.40 | 8 31.461 −8.50
+ 56 38 38.88 | 38 39.30 | 38 39.55 | 38 38.57 | 38 38.28

+37.34 −24.56 | +6.19 −36.24 | +31.94 −30.80 | +26.33 −15.94 | +23.02 −31.92
50 50 | 50 | 50 | 50 | 50
−2.16 | −2.19 | −2.12 | −2.07 | −2.06

4 8.0 4 57.1 | 4 12.0 4 39.0 | 4 27.3 4 57.0 | 4 6.9 4 51.0 | 4 9.9 4 39.8 | 4 12.3 4 52.0
23.1 8.1 | 24.0 35.1 | 31.1 1.4 | 12.0 57.1 | 23.8 54.0 | 27.4 6.0
31.1 119.2 | 36.0 94.1 | 58.4 118.4 | 18.9 108.1 | 33.7 93.8 | 39.7 118.0
54′ 15.55″ 54 59.60 | 54 18.00 54 47.05 | 54 29.20 54 59.20 | 54 9.45 54 54.05 | 54 16.85 54 46.90 | 54 19.85 54 59.00

1.57217 1.39023n | 0.79169 1.55919n | 1.50433 1.48855n | 1.42045 1.20249n | 1.36211 1.50488n
1.42245 1.24057n | 0.64197 1.40947n | 1.35069 1.33491n | 1.26681 1.04885n | 1.20847 1.35124n
+26.45 −17.40 | +4.38 −25.67 | +22.42 −21.62 | +18.49 −11.19 | +16.16 −22.40
54 42.00 54 42.20 | 54 33.38 54 33.53 | 54 31.87 54 32.43 | 54 35.34 54 35.71 | 54 36.01 54 36.60

+56° 28′ 6.35″ 6.15 | 28 14.77 14.82 | 28 16.48 15.92 | 28 13.01 12.64 | 28 12.34 11.75
6.25 + 15 | 14.79 | 16.20 | 12.82 | 12.04
−14 16 2 15 17 | 15 57 15 18
1.16560n 1.16530n | 1.16560n 1.16530n
−996 | −422 | +121 | −1999 | −1809
1.15564 1.15534 | 1.16138 1.16108 | 1.16681 1.16651 | 1.14561 1.14531 | 1.14751 1.14721
+14.31 +14.30 | +14.50 +14.49 | +14.68 +14.67 | +13.98 +13.98 | +14.04 +14.04

−.35 −.62 −.15 | −.1 −.55 −.33 | −.24 −.04 −.22 | −.16 +.07 −.06 | −.14 −.01 −.25
−.34 −.40 −.94 −.38 | −.36 −.40 | +.17 +.20 | +.17 +.19 | +.17 +.20
+13.62 +13.75 | +14.13 +13.76 | +14.61 +14.65 | +13.99 +14.11 | +14.07 +13.99
28 19.97 19.90 | 28.90 28.58 | 31.05 30.57 | 27.00 26.75 | 26.41 25.74
38 41.8 | 43.8 | 45.3 | 46.0 | 46.1
+10 21.8 21.9 | 14.9 14.2 | 14.2 14.9 | 19.0 19.3 | 19.9 20.4
+10 21.8 | 14.5 | 14.5 | 19.1 | 20.0
+10 22.17 38 38.48 | + 16.01 16.56 39.26 | + 15.52 16.05 39.44 | + 18.85 19.37 37.97 | + 19.69 20.20 38.11
+ .54 22.71 38.41 | + .55 −25.85 38.94 | + .53 27.35 38.92 | + .52 −28.05 37.72 | + .51 −28.15 37.44
− 4.20 23.85 | − 6.20 | − 7.70 | − 8.40 | − 8.50
+10 18.51 38 38.44 | + 10.36 39.10 | + 8.35 39.18 | + 10.97 37.84 | + 11.70 37.77
38 18.79 | 19.45 | 19.53 | 18.19 | 18.12

1875

	^m	^s		'	"	
Apr. 30	48	34.96		37	76.7	
May 5		34.89	−.07		77.9	+1.2
10		34.82	.07		79.1	1.2
15		34.74	.08		80.1	1.0
20		34.65	.09		81.1	1.0
25		34.55	.10		82.0	.9
30		34.44	.11		82.8	.8
June 4		34.32	.12		83.5	.7
9		34.19	.13		84.1	.6

1875

α 31.480

δ +38 17.94

$\frac{d\alpha}{dt}$ +2.661

$\frac{d\delta}{dt}$ −19.649

L cos δ 9.74036

Lb .12552

Lb' 9.86588

1874.0 α	δ	1875.0 α	δ
28.84		31.50	
90		41	
91		48	
87		51	
80		40	
		55	
28.864		31.475	
.819	37.59	.480	17.94
+.045		−.005	

1875

−.32

May 12

−.320

48	48 39.9
26.3	42.9
28.3	45.5
30.2	
32.0	
33.9	
35.9	
37.6	
39.4	
41.3	
30.49	48 42.77
48 33.878	
33.850	+1.48
48 34.79	−.49
−0.94	
	−3.31
+ 1.45	48 31.53
− .49	
− 3.31	
− 2.35	
48 33.85	54 26.63
	−16 59.3
48 31.50	+.7
	−1.70
+56	38 19.70
δ	
−8.89	
25	
−2.41	
3 34.0	
50.8	
84.8	
28 42.40	
0.94890n	
0.81478n	
−6.53	
28 35.87	
54 12.48	
−421	
1.16139	1.16105
+14.50	+14.49
− .2 ~~−.17~~	
−.33 −.35	
+14.15	
54 26.63	
38 19.6	
−16 7.0	
−16 7.0	
−16 6.48	5.88
+ .60	
− 1.70	
−16 7.58	38 19.05

−.32

May 17

−.340

48	48 5.1
25.8	8.9
27.6	12.4
29.6	
31.2	
33.1	
35.2	
37.0	
39.0	
40.7	
29.92	48 8.80
48 33.244	
33.216	+1.96
48 34.70	−.49
−1.48	
	−3.22
+ 1.93	31.47
− .52	
− 3.22	
− 1.81	
48 33.22	28.55
	−16 6.47
48 31.41	+.5
	−2.60
	38 19.98
aure +24.44	
25	
−2.76	
3 8.1	
24.5	
32.6	
28 16.30	
1.38810	
1.25398	
+17.94	
28 34.24	
54 14.11	
+7.20	
1.17280	1.17250
+14.89	
−.15 ~~−.27~~	
−.30 −.45	
+14.44	
28.55	
20.35	
8.0	
8.0	
− 6.87	6.31
+ .56	
− 2.60	
− 8.91	38 19.64

−.43

May 22

−.428

48 10.4	48 13.1
14.2	
17.9	
25.3	
29.0	
32.8	
36.5	48 57.7
40.3	0.5
47.8	4.5
51.6	
55.3	
36.11	48 13.10
48 32.827	49 0.90
32.799	+2.49
48 34.61	−.65
−1.81	
	−3.13
+ 2.46	31.51
− .65	
− 3.13	
− 1.32	
48 32.80	28.28
	−16 5.57
48 31.48	+.5
	−3.60
	38 19.61
+19.73	−28.07
25	
−2.17	
3 8.7	3 43.2
30.4	5.2
89.1	108.4
28 19.55	28 54.20
1.29513	1.44824
1.16101	1.31412n
+14.49	−20.61
28 34.04	28 33.59
54 14.31	14.76
14.53	
15 29	14 54
1.16540n	1.16500n
−1247	
1.15293	1.15253
+14.22	+14.21
−.09 −.46	−.19
−.30	−.35
+13.83	+13.67
28.14	28.43
21.5	
6.6	6.5
6.8	
− 5.61	5.07 19.47
+ .54	19.76
− 3.60	
− 8.67	19.62

−.52

May 27

−.506

48 9.6	48 1.6
13.1	4.4
17.1	8.3
24.4	
28.5	
32.1	
35.9	48 49.4
39.5	
47.0	
50.7	
54.6	
35.25	48 4.77
48 32.045	48 49.40
32.017	+3.30
48 34.51	−.79
−2.49	
	−3.03
+ 3.29	31.50
− .77	
− 3.03	
− 0.51	
48 32.02	27.27
	−16 3.59
48 31.51	+.5
	−4.50
	38 19.68
+27.27	−17.36
25	
−2.07	
3 3.0	3 35.7
26.9	0.0
29.9	95.7
28 14.95	28 47.85
1.43569	1.23955n
1.30157n	1.10543
+20.03	−12.75
28 34.98	28 35.10
54 13.37	13.25
13.31	
−665	
1.15875	1.15835
+14.41	+14.40
−.18 −.44	−.07
−.29	−.34
+13.94	+13.99
27.31	27.24
22.4	
4.9	4.8
4.9	
− 4.01	3.49 19.32
+ .52	19.25
− 4.50	
− 7.99	19.28

−.44

May 29

−.488

48 9.6	47 51.3
13.3	55.0
17.0	58.0
24.6	
28.5	
32.0	
35.8	48 53.5
39.4	57.0
47.0	0.3
50.8	
54.4	
35.24	47 54.77
48 32.036	48 56.93
32.008	+3.08
48 34.46	−.67
−2.45	
	−2.98
+ 3.11	31.44
− .74	
− 2.98	
− 0.61	
48 32.01	28.53
	−16 4.98
48 31.40	+.5
	−4.80
	38 19.25
+37.27	−24.89
25	
−2.06	
2 55.3	3 41.1
17.5	2.3
132.8	103.4
28 6.40	28 51.70
1.57136	1.39602n
1.43724n	1.26190
+27.37	−18.28
28 33.77	28 33.42
54 14.58	14.93
14.75	
−291	
1.16209	1.16209
+14.52	+14.52
−.35 −.74	−.15
−.43	−.55
+13.74	+13.82
28.32	28.78
22.7	
5.6	6.0
5.8	
− 5.28	4.77 18.75
+ .51	19.18
− 4.80	
− 9.57	18.96

−.50

June 8

−.485

48 10.5	47 53.8
14.2	57.2
18.0	1.0
25.4	
29.0	
32.9	
36.6	48 55.0
40.5	53.4
47.9	57.2
51.5	
55.4	
36.22	47 57.33
48 32.927	48 53.53
32.899	+2.11
48 34.231	−.76
−1.581	
	−2.73
+ 2.12	31.52
− .74	
− 2.73	
− 1.35	
48 32.90	29.99
	−16 5.59
48 31.55	+.6
	−6.10
	38 18.90
+35.60	−20.60
25	
−1.96	
2 54.3	3 35.5
18.4	58.4
132.7	93.9
28 6.35	28 46.95
1.55145	1.31387n
1.41733n	1.17975n
+26.14	−15.13
28 32.49	28 31.82
54 15.86	16.53
16.19	
15 42	15 1
1.16540	1.16510
−421	
1.16119	1.16089
+14.49	+14.48
−.31 −.68	−.10
−.43	−.53
+13.75	+13.85
29.61	30.38
24.0	
5.6	6.4
6.0	
− 5.73	5.24 18.21
+ .49	19.04
− 6.10	
− 11.34	18.65

83

12 Can. Ven. um

h m sec.
12 50 11

+ 39° 0′

γ = + 3° 23′
γ sin z = + 0.06

corr α = s
corr δ = − 0.60″

tang δ = + .81 1.29

I = 2.67 s

k = − .020 s

1874		m s			″	
Apr.	30	50 9.98		59	54.7	
May	5	9.95	− .03		55.7	+ 1.0
	10	9.92	.03		56.7	1.0
	15	9.88	.04		57.6	.9
	20	9.83	.05		58.5	.9
	25	9.78	.05		59.3	.8
	30	9.72	.06		60.1	.8
June	4	9.65	.07		60.8	.7
	9	9.58	.07		61.4	.6

1874
α 7.829 s
δ + 59 57.12″
dα/dt + 2.816 s
dδ/dt − 19.528″

l cos δ 9.89050
l 6 .10992
l 6′ .00042

l 6′ 9.99650

l sin δ 9.79887

1875
10.645
+ 59 37.59
+ 2.816
− 19.528

9.89050
.12552
.01602

× 1874 −.15 −.04
May 13

May 14

× −.18 −.08
May 19

× 1874 −.45
June 10

1875 −.32
May 12

−.43
May 22

+.164 +.265 −.405 −.320 −.426

49 9.5 48 56.5 | 49 6.1 49 2.9 | 49 57.8 49 56.4 | 49 56.0 49 43.7 | 49 55.0 49 46.0
12.1 59.7 | 8.7 | 0.2 59.1 | 58.6 46.1 | 57.6 48.3
14.8 1.4 | 11.4 | 2.9 1.3 | 50 1.4 48.2 | 50 0.3 50.9
20.2 | 16.6 | 8.2 | 6.5 | 5.6
22.7 | 19.2 | 10.8 | 9.2 | 8.2
25.4 | 22.0 | 13.5 | 11.9 | 10.9
28.1 49 48.6 | 24.6 49 46.1 | 16.3 50 54.6 | 14.6 50 28.4 | 13.6 50 27.0
30.7 51.2 | 27.3 49.0 | 18.8 56.6 | 17.2 30.8 | 16.2 29.9
36.6 53.3 | 32.6 51.5 | 23.9 58.6 | 22.5 33.6 | 21.4 32.1
38.7 | 35.2 | 26.5 | 25.3 | 24.1
41.4 | 38.0 | 29.2 | 28.0 | 26.7

2796 | 2417 | 2081 | 2512 | 2396
60 | 120 | 120

48 59.20 | 49 2.90 | 1481 49 58.93 | 1312 49 46.00 | 1196 49 48.40
49 25.418 49 51.03 | 49 21.973 49 48.87 | 49 13.464 50 56.60 | 50 11.927 50 30.93 | 50 10.873 50 29.67
25.398 +44.73 | 21.953 +48.18 | 50 13.444 −3.48 | 11.907 +1.48 | 10.853 +2.49
50 9.90 −.12 | 50 9.84 −.15 | 50 9.570 −.36 | 50 13.07 −.26 | 50 12.98 −.35
−44.50 −.05 | −47.89 −.10 | −56.182 | −1.16 | −2.13
−2.07 | −2.01 | −1.73 | −2.43 | −2.34

+ 44.68 50 7.89 | + 48.12 7.87 | − 3.50 7.57 | + 1.45 10.70 | + 2.46 10.65
− .13 | − .21 | − .32 | − .26 | − .34
− 2.07 +0.746 | − 2.01 +0.806 | − 1.73 +1.086 | − 2.43 | − 2.34
+ 42.48 | + 45.90 | − 5.55 | − 1.24 | − 0.22
49 25.40 49 35.09 | 49 21.95 43.64 | 49 (50) 13.44 44.26 | 50 11.91 15 42.35 | 50 10.85 15 42.75
+10 22.55 | +10 16.17 | +10 17.28 | −16 5.93 | −16 5.57
50 7.88 −.1 | 50 7.85 −.1 | 50 7.89 −.7 | 50 10.67 −.2 | 50 10.63 −.2
10.696 −020 | 10.666 −130 | 10.706 −440 | ~~456~~ ~~33~~ +240 | +060
+38 59 ~~54.64~~ ~~57.6~~ 57.34 | 59 58.41 | 59 57.04 | ~~59~~ 59 38.62 | ~~33~~ 59 37.58

−45.47
+ 26.22 − 25.61 | + 19.07 − 26.90 | + ~~14.53~~ + 14.53 − 43.14 | + 25.93 − 19.80 | + 22.47 − 18.80
30 30 | 30 | 30 5 | 5
1 − 2.18 | − 2.20 | − 2.04 | − 2.41 | − 2.17

2 33.9 3 25.0 2 40.6 3 37.0 | 2 39.1 3 25.5 | 3 39.8 3 39.0 | 1 26.9 2 13.5 | 1 28.5 2 11.8
53.0 44.9 0.0 56.8 | 44.0 30.7 | 50.9 49.5 | 44.8 30.7 | 48.1 32.0
869″ 699 1006 938 | 831 562 | 967 885 | 717 442 | 766 438
32 43.45 33 34.95 32 50.30 33 46.90 | 32 41.55 33 28.10 | 33 45.35 33 44.25 | 6 35.85 7 22.10 | 6 38.30 7 21.90

(32)
1.16227

1.41863 1.40841n | 1.28035 1.42975n | 1.65772n 1.63488 | 1.41380 1.29003n | 1.35760 1.27416n
1.41905 1.40883n | 1.28077 1.43017n | 1.65422n 1.63138 | 1.42982 1.30605n | 1.36762 1.29018n
+26.25 − 25.64 | + 19.09 − 26.93 | − 45.10 − 42.79 | + 26.91 − 20.23 | + 22.81 − 19.51
+14.42
33 9.70 33 9.31 | 33 0.34 33 1.17 | ~~33~~ ~~0.25~~ 33 1.46 | 7 2.76 7 1.877 | 1.61 7 2.39
32. 59.77

49 38.65 39.04 | 49 47.71 47.18 | 49 48.58 46.89 | 15 45.59 46.48 | 15 46.74 45.96
38.84 | 47.44 | 47.73 | 46.03 | 46.35
+3 22 26 23 18 | 22 28 23 27 | 22 48 23 34
0.53080 0.53270 | 0.53100 0.53290 | 0.53160 0.53340
−990 | + 53 | −910 | −421 | −1234
.52090 .52280 | .53133 .53323 | .52190 .52380 | .52735 .52815 | .51926 .52006
− 3.32 − 3.33 | − 3.40 − 3.41 | − 3.33 − 3.34 | − 3.37 − 3.37 | − 3.30 − 3.31

−.18 −.43 −.17 | −.10 −.39 −.19 | −.05 −.14 −.49 | −.17 −.31 −.10 | −.13 −.29 −.09
− .22 − .29 | − .22 − .28 | + .11 + .15 | − .14 − .22 | − .14 − .22
− 3.72 − 3.79 | − 3.72 − 3.88 | − 3.27 − 3.68 | − 3.68 − 3.69 | − 3.57 − 3.62
49 34.93 35.25 | 48.99 43.30 | 45.31 43.21 | 15 41.91 42.79 | 43.17 42.34
59 57.3 | 58.4 | 61.5 | 35.2 | 37.0
+10 22.4 22.1 | 14.4 15.1 | 16.2 18.3 | −16 6.9 7.6 | 6.2 6.3
+10 22.25 | 14.75 | 17.25 | −16 7.15 | 5.75
+10 21.6 +59 56.77 | 14.1 58.63 | 16.6 57.47 | −16 7.7 37.69 | 6.3 38.03
+10 22.17 22.04 57.09 | + 16.07 15.94 57.94 | + 16.68 16.55 55.37 | − 16 6.48 6.62 38.57 | − 5.61 5.74 37.20
− .13 − 19.73 | − .13 − 20.83 | − .12 − 23.93 | .14 | .13
− 0.20 54 56.93 | − 1.30 58.28 | − 4.40 56.42 | + 2.40 38.13 | + 0.60 37.61
+10 21.84 59 37.40 | + 14.64 38.75 | + 12.16 36.89 | −16 4.22 | − 5.14

1875

		m	s		'	"	
Apr. 30		50	13.15		59	32.8	
May. 5			13.12	-.03		33.8	+1.0
	10		13.09	.03		34.8	1.0
	15		13.05	.04		35.7	.9
	20		13.00	.05		36.6	.9
	25		12.94	.06		37.4	.8
	30		12.88	.06		38.2	.8
June 4			12.81	.07		38.9	.7
	9		12.74	.07		39.5	.6

1875

-44 May 29 -488 -50 June 8 -485

49 54.4 49 45.1 49 55.2 49 45.0
56.9 47.0 57.8 47.6
59.5 49.4 50 0.4 49.4
50 6.0 5.6
7.5 8.4
10.3 11.0
13.0 50 42.1 13.7 50 22.4
15.4 44.3 16.2 24.4
20.9 46.2 21.7 26.5
23.4 24.4
26.2 27.7

29.25 24.22
180 120
11.25 49 47.17 12.22 49 47.33
50 10.227 50 44.20 50 11.109 50 24.53
10.207 +3.08 11.089 +2.11
50 12.89 -.36 50 12.75 -41
-2.68 -1.66
-225 -2.11
+ 3.11 50 10.68 + 2.12 10.68
— .39 — .39
– 2.25 – 2.11
+ 0.47 – 0.38
50 10.21 15 43.99 50 11.09 44.96
-16 4.98 -16 5.59
50 10.68 -.1 50 10.71 -.1
-0.50 -1.80
38 59 38.41 59 37.47

s
+23.06 -33.97 +23.78 -13.42
5 5
-2.06 -1.96
1 25.9 2 24.8 1 24.1 2 2.4
47.8 46.0 46.8 24.0
73.7 70.8 70.9 26.4
6 36.85 7 35.40 6 35.45 7 13.20

1.36286 1.53110 1.37438 1.12775
1.37888 1.54712 1.39040 1.14377
+23.93 -35.25 +24.57 -13.92
7 0.78 7 0.15 7 0.02 6 59.28

15 47.57 48.20 15 48.33 49.07
47.88 48.70
22 47 23 25
0.53170 0.53290
-285 -413
.52875 .52955 .52757 .52877
-3.38 -3.38 -3.37 -3.38

-.14 -.51 -.31 -.15 -.36 -.05
-22 -26 -22 -31
-3.44 -4.05 -3.44 -3.74
15 43.83 44.15 44.59 45.33
38.1 39.4
-16 5.7 6.0 5.2 5.9
-16 5.8 5.5
-16 6.4 59 37.93 6.1 36.94
-16 5.28 38.25 -5.73 37.68
5.40 5.85
– .12 – .12
– 0.50 59 38.09 – 1.80 37.31
-16 5.90 – 7.65

84 1874

δ Draconis.
12h 50m 30sec.
+66° 7′
γ = −23° 44′
$\gamma \sin z$ = −.40

May. 20	50m	30.94s		7′	26.7″	
25		30.77	−.17		27.6	+.9
30		30.60	.17		28.4	.8
June 4		30.42	.18		29.1	.7
9		30.24	.18		29.7	.6
14		30.05	.19		30.1	.4
19		29.86	.19		30.4	.3
24		29.66	.20		30.6	.2
29		29.45	.21		30.7	.1

	1874	1875
α	27.288s	29.704
δ	7′ 19.58″	6 59.96
$\frac{d\alpha}{dt}$	+2.416s	+2415
$\frac{d\delta}{dt}$	−19.624″	−19.624

cor α = −.074s
cor δ = +1.06″

tang δ = +2.26

I = 5.08s

K = −.037s

l cos δ 9.60732
l b .10992
l b′ 9.71724

l b′ 9.71332

l sin δ 9.96112

× 1874 −28
May 24
~~−268~~ −2.72
12 49 30.6 49 14.9
33.2 19.4
35.7 23.2
38.2
40.8
43.2
45.8 50 6.4
48.4 5.7
51.0 10.1

× −29
June 2
−.220
49 26.6 49 6.7
29.3 11.0
32.2 14.8
34.4
36.9
39.6
42.1 49 53.2
44.6 56.6
47.0 1.9

× −42
June 9
−.420
—
—
—
—
—
~~50~~ 49 37.3 34.76 ·36
39.4 ·36 48.7
42.3 ·88 53.0
44.6 ·44 58.7

36 6 9 49 19.17 33 27 49 10.83 16 3 6
49 40.767 50 5.40 49 36.967 49 57.23 ~~50~~ 49 34.560 ~~51~~ 49 53.47

40.730 +50.56 36.930 +54.08 49 34.52 +56.55
50 30.870 −.63 50 30.5048 −.66 50 30.253 −.95
−50.087 −53.585 − 55.801
−50.50 −3.51 −53.48 −3.19 −55.64 −2.94
50 27.15 27.16 27.18

+ 50.56 + 53.987 − 3.45
− .61 − .50 − .95
− 3.51 −1.094 − 3.19 −0.774 − 2.94 −0.524
+ 46.44 57 1213 + 50.28 1313 − 7.34 943
49 40.73 +10 1626 49 36.93 +10 1582 ~~49~~ 50 34.52 +10 2011
+.9 +~~3~~.9 +.9
50 27.17 67 −790 50 27.21 −930 50 27.18 −1010
29.58666 7 21.39 29.626 7 20.55 29.596 7 20.34

+21.60 −24.63 +26.14 −20.26 −18.91
25 25 25

−2.19 −2.12 −2.06
0 48.8 1 12.1 0 44.1 1 8.9 1 6.0
51.5 15.2 49.1 14.0 19.9
10 0 3 273 932 229 259
25′ 50.15 26 13.65 25 46.60 26 11.45 26 12.95

1.38440 1.39146n 1.41731 1.30664n 1.27669n
1.05169 1.10870n 1.13063 1.01996n 0.99001n
+11.27 −12.84 +13.51 −10.47 −9.77
26 1.42 26 0.81 26 0.11 26 0.98 26 3.18

+65° 56′ 46.93″ 47.54 56 48.24 47.37 56 45.17
47.23 47.80
−23 44 27 44 3 44 30 44 6
1.40350n 1.40330n 1.40350n 1.40330n
−414 +127 −1806
1.39936 1.39916 1.40477 1.40457 1.38524
+25.08 +25.07 +25.40 +25.38 +24.28

−.09 −.13 −.11 −.13 −.06 −.08 −.02 −.7
−.06 −.10 +.03 +.05 +.05
+24.93 +24.86 +25.30 +25.35 +24.26
57 11.86 12.40 13.54 12.02 9.43
7 27.5 28.9 29.7
+10 15.6 +10 15.7 15.4 16.2 20.3
+10 15.35 15.80 20.30
+10 16.4 20.85 16.9 20.61 21.4
+10 16.01 16.89 21.39 + 15.52 16.37 19.79 + 19.69 20.51
+ .88 27.52 + .85 28.92 + .82 29.72
− 7.90 7 21.12 − 9.30 20.20 − 10.10 19.84
+10 8.99 7 1.50 + 7.07 0.58 + 10.41 0.22

6 Comae. α δ $\frac{d\alpha}{dT}$ $\frac{d\delta}{dT}$

h m sec
12 32 44
+18° 6′

	1874	1875 →
α		52 44.54
δ		5 0.43
$\frac{d\alpha}{dT}$		+ 2.972
$\frac{d\delta}{dT}$		− 19.49
log cos δ	9.97796	9.97796
lb	.10992	.12552
lb′	.08788	.10848 3
lb′	.08396	
log sin δ	9.49231	

φ = +24° 17′
J sin z = +.41

corr α =
corr δ =

tang δ = +.33
s
I = 2.17
s
k = −.016

1874

May 13		May 19		May 24		May 26		June 2		June 9	
f .164		f −.265		~~.268~~ −2.72		f .280		−.220		−.420	
51 45.5	51 36.0	51 42.1	51 25.6	51 39.6	51 27.6	51 38.9	51 27.7	51 36.2	51 27.9	~~51~~ 2 33.7	~~51~~ 2 26.0
47.6	38.3	44.4	28.0	41.7	30.3	41.0	29.9	38.3	30.0	35.8	27.9
49.9	39.8	46.4	29.9	44.0	31.9	43.2	31.6	40.3	31.7	38.0	30.3
54.2		50.8		48.3		47.5		44.7		42.3	
56.4		53.1		50.5		49.6		46.9		44.4	
58.6		55.2		52.6		51.9		49.0		46.6	
0.7	52 14.0	57.3	52 9.8	54.8	52 13.1	54.0	52 11.8	51.1	52 3.4	48.7	~~51~~ 2 52.0
2.9	16.5	59.5	12.4	57.0	13.4	56.2	14.1	53.4	5.3	51.0	2 1.2
7.3	18.4	4.0	14.1	1.3	17.1	0.5	15.9	57.8	7.4	55.4	3.1
9.4		6.1		3.5		2.8		59.9		57.5	
11.5		8.3		5.7		4.9		2.1		59.6	
3440		4272		3990		3905		4797		5130	
300		180		180		180		60			
6440	51 38.03	6072	51 27.83	5790	51 29.93	5705	51 29.73	5397	51 29.87		5~~1~~2 28.07
51 58.545	52 16.30	51 55.200	52 12.10	51 52.636	52 15.20	51 51.864	52 13.93	51 49.064	52 5.37	5~~1~~2 46.636	5~~2~~3 1.10
58.529		55.184		52.620		51.848		49.048		46.620	
+ 44.68		+ 48.12		+ 50.56		+ 51.36		+ 53.96		− 3.46	
− .05		− .09		− .09		− .09		− .07		− .14	
− 1.63	+1.342	− 1.60	+1.372	− 1.54	+1.402	− 1.56	+1.412	− 1.51	+1.462	− 1.45	+1.522
+ 43.00		+ 46.43		+ 48.90		+ 49.71		+ 52.39		− 5.04	
51 58.53		51 55.18		51 52.64		51 51.85		51 49.05		5~~1~~2 46.62	
52 41.53		52 41.61		52 41.52		52 41.56		52 41.44		52 41.58	
44.502		44.582		44.492		44.532		44.412		44.552	

25 +20.51	−17.76	25 +27.37	−16.90	25 + 22.71	−22.56	25 +22.13	−22.07	25 +19.19	−16.31	25 +18.57	−14.46
−2.18		−2.20		−2.19		−2.18		−2.12		−2.06	
1 52.4	2 38.9	1 41.6	2 35.9	1 47.0	2 42.6	1 50.9	2 44.9	1 49.0	2 32.7	1 49.6	2 30.1
15.1	1.3	49.9	43.2	56.9	52.2	0.7	53.6	1.1	43.7	11.2	52.0
1275″	1002	915	799	1039	948	1116	985	1101	764	1208	821
27 3.75	27 50.10	26 45.75	27 39.95	26 51.95	27 47.40	26 55.80	27 49.25	26 55.05	27 38.20	27 0.40	27 41.05
1.31197	1.24944n	1.43727	1.22789	n1.35622	1.35334n	1.34498	1.34380n	1.28307	1.21245n	1.26881	1.16017n
1.39985	1.33732n	1.52515	1.31577	n1.44410	1.44122n	1.43286	1.43168n	1.36703	1.29641n	1.35277	1.24413n
+25.11	−21.74	+33.51	−20.69	+27.80	−27.62	+27.09	−27.02	+23.29	−19.79	+22.53	−17.55
27 28.86	27 28.36	27 19.26	27 19.36	27 19.75	27 19.78	27 22.89	27 22.23	27 18.34	27 18.41	27 22.93	27 23.50
+17° 55 19.49	19.99	55 29.09	29.09	55 28.60	28.57	55 25.96	26.12	55 30.01	29.94	56 25.42	24.85
19.74		29.09		28.58		26.04		29.97		25.13	
+24 16 47	17 33										
1.41450	1.41480										
−983		+63		−403		−406		+133		−1802	
1.40467	1.40497	1.41513	1.41543	1.41047	1.41077	1.41044	1.41074	1.41583	1.41613	1.39648	1.39678
−25.39	−25.41	−26.01	−26.03	−25.73	−25.75	−25.73	−25.75	−26.05	−26.07	−24.92	−24.93
−.06 −.25	−.05	−.11 −.25	−.04	−.07 −.25	−.07	−.07 −.07	−.07	−.05 +.05	−.03	−.04 +.06	−.03
−.17	−.22	−.14	−.21	−.15	−.12	.00	.00	+.08	+.10	+.08	+.11
−25.62	−25.68	−26.26	−26.28	−25.95	−26.04	−25.80	−25.82	−26.02	−26.06	−24.88	−24.85
+17 54 53.87	54.31	55 2.83	2.81	55 2.65	2.53	55 0.16	0.30	55 3.99	3.94	55 0.54	0.00
+10 22.17	21.28	+ 16.07	15.17	+16.01	15.12	+17.85	16.96	+ 15.52	14.66	+ 19.69	18.85
+ 5.13	−14.36	+ 4.40	−15.09	+ 3.81	−15.68	+ 3.58	−15.91	+ 2.81	−16.68	+ 2.11	−17.38
− .89	5 20.28	− .90	22.40	− .89	21.58	− .89	20.70	− .86	21.46	− .84	21.50
+10 26.41	20.72	+ 19.57	22.38	+ 18.93	21.46	+ 20.54	20.84	+ 17.47	21.41	+ 20.96	20.96
	5 20.50		22.39		21.52		20.77		21.43		21.23
	5 1.01		2.90		2.03		1.28		1.94		1.74

1874 June 10

1875 May 17

May 22

-.405		-.340		-.425	
12 52 38.7	52 39.3	52 31.6	52 20.9	52 31.1	52 23.1
35.8	41.0	33.7	23.6	33.3	23.0
37.9	42.5	36.0	25.5	35.3	27.0
42.2		40.3		39.7	
44.5		42.5		41.9	
46.7		44.6		44.1	
48.8	53 15.7	46.8	52 54.1	46.3	53 9.4
50.9	17.4	49.0	0.1	48.5	11.6
55.3	18.9	53.2	1.9	52.8	13.7
57.4		53.4		54.9	
59.6		57.7		57.1	
5128		4908		4852	
	52 40.93		52 23.33		52 25.03
52 46.618	53 17.33	52 44.618	53 0.03	52 44.109	53 11.57
46.602		44.602		44.093	
- 3.50		+ 1.93		+ 2.46	
- .13		- .11		- .14	
- 1.44	+1.532	- 1.95		- 1.92	
- 5.07		- 13		+ 0.40	
52 46.60		52 44.60		52 44.09	
52 41.53		52 44.47		52 44.49	
	44.502				
41.539				44.480	
25 +5.69	-30.71	0 +21.29	-15.41	0 +19.08	-27.46
1 -2.04		-2.26		-2.17	
2 6.7	2 50.0	0 46.5	1 33.3	0 49.4	1 49.8
20.0	3.3	0.9	46.9	8.0	7.9
267 ,,	113.3	107.4	80.2	117.4	117.7
27 133.5	27 56.65	0 53.70	1 40.10	0 58.70	1 58.85
0.75511	1.48728	1.32818	1.18780	1.28058	1.43870
0.83907	1.57124	1.43166	1.29128	1.38406	1.54218
+6.90	-37.26	+27.02	-19.56	+24.22	-34.85
27 20.25	27 19.39	1 20.72	1 20.54	1 22.92	1 24.00
55 28.10	28.96	21 27.63	27.81	21 25.43	24.35
28.53		27.72		24.89	
16 56	17 40	17 6	17 52	17 11	18 11
1.41460	1.41480	1.41460	1.41490	1.41470	1.41500
-900		+737		-1216	
1.40560	1.40580	1.42197	1.42227	1.40254	1.40284
-25.45	-25.46	-26.42	-26.44	-25.27	-25.28
	-.13	-.07	-.03	-.05	-.11
-1 +.03			-.16		-.21
+.09	+.12	-.08	-.15	-.09	-.18
-25.37	-25.47	-26.57	-26.62	-25.41	-25.57
55 2.73	3.49	21 1.06	1.19	21 0.02	58.78
+10 16.68	15.85	-16 6.87	7.79	-16 5.61	6.49
+2.01	-17.48	+16.95		+6.35	
- .83	55 20.59	- .92	0.22	- .88	59.88
+ 17.86	21.35	16 0.84	0.35	- 0.14	58.64
	20.97		5 0.28		4 59.26
	1.48				

93

ε Virginis.
12ʰ 55ᵐ 57ˢ
+ 11° 38′
1 cos α =
+30° 45 cos δ =
sin z = +.51
tang δ = +.21 1.02
I = 2ˢ.10
K = ˢ.016

1874
Apr. 30 55ᵐ 55ˢ.84 38′ 4″.4
May. 5 55.83 −.01 4.9 +.5
10 55.82 .01 5.3 .4
15 55.80 .02 5.8 .5
20 55.78 .02 6.3 .5
25 55.75 .03 6.8 .5
30 55.72 .03 7.2 .4
June 4 55.68 .04 7.7 .5
9 55.64 .04 8.2 .5

1874
α 54ˢ.247
δ +38′ 12″.53
dα/dT +2ˢ.987
dδ/dT −19″.435
log cos δ 9.99099
l.c .10992
l.c′ .10091
l.c′ .09699
log sin δ 9.30459

1875
57.234
+37 53.10
+2.987
−19.434
9.99099
.12552
.11651

1874
X −.15 −.04 May 13 +.164
X −.28 May 24 ~~−.368~~ −2.72
X −.28 May 26 −.280
X −.29 June 2 −.220
June 9 Chrf.
1874 X −.45 June 10 −.405

54 58.5 54 46.6 54 52.7 54 41.4 54 51.8 54 45.3 54 49.1 54 43.1 55 46.7 55 38.1
0.6 48.7 54.7 43.4 53.9 47.5 51.1 45.3 48.8 40.1
2.8 50.7 56.9 45.4 56.2 49.3 53.2 47.0 50.9 41.7
7.0 1.1 0.3 57.5 53.0
9.1 3.1 2.4 59.6 57.1
11.2 5.2 4.5 1.7 59.3
13.2 55 21.1 7.3 55 18.6 6.6 55 26.9 3.7 55 21.6 1.3 56 22.6
15.3 23.2 9.4 20.2 8.7 29.7 5.9 23.8 8.4 24.1
19.6 24.9 13.7 21.8 12.8 32.0 10.1 25.9 7.6 26.3
21.6 15.8 15.1 12.2 9.7
23.9 17.9 17.2 14.3 11.8

1828 2378 2295 3184 3516
60 180 180 300 300
1228 54 48.67 578 54 43.40 495 54 47.37 184 54 45.13 6516 55 39.97
55 11.164 55 22.07 55 5.255 55 20.20 55 4.500 55 29.513 55 1.673 55 23.77 55 59.236 56 24.313
+44.78 +50.56 +51.36 +54.08 −3.47
11.148 −.03 5.239 −.06 4.484 −.06 1.657 −.06 59.220 −.09
55 55.81 −.04 55 55.76 55 55.74 55 55.70 55 55.63
−44.66 −1.56 −50.52 −1.51 −51.26 −1.49 −54.04 −1.45 +3.59 −1.38
55 54.~~08~~25 54.23 54.29 54.23 54.28
:25
+ 44.68 + 50.56 + 51.36 + 53.967 − 3.50
− .03 − .05 − .06 − .04 − .08
− 1.56 +1.427 − 1.51 +1.477 − 1.49 +1.497 − 1.45 +1.537 − 1.38 +1.607
+ 43.09 27 44.15 + 49.00 51.87 + 49.81 49.34 + 52.48 ~~40.74~~ 53.44 − 4.96 51.96
55 11.15 +10 22.55 55 5.24 +10 16.26 55 4.48 +10 17.66 55 1.66 +10 15.82 55 59.22 +10 17.28
−7.1 −7.1 −1.0 −1.0 −1.0
55 54.24 +6.90 55 54.24 +5.80 55 54.29 +5.60 55 54.14 +5.00 55 54.26 +4.20
57.227 11 38 12.50 57.227 38 12.83 57.277 38 11.60 57.127 38 ~~4.76~~ 13.26 57.247 38 12.46

+22.49 −11.91 +21.85 −14.95 +17.13 −25.03 +~~2~~16.54 −~~1~~22.10 +19.27 −25.09
50 50 50 50 50 50
−2.18 −2.19 −2.18 −2.12 −2.04
3 51.1 4 33.9 3 50.0 4 35.0 3 58.5 4 52.3 3 53.8 4 42.5 3 49.0 4 36.4 3 52.7 3 48.2
13.6 56.1 0.9 45.4 7.2 2.1 5.7 54.7 10.4 59.0 5.2 0.3
12.47 9.00 11.09 8.04 12.57 11.44 11.95 9.72 11.94 9.54 11.79 10.85
54 2.35 54 45.00 53 55.45 54 40.20 54 2.85 54 57.20 53 59.75 54 48.60 53 59.70 54 47.70 53 58.95 53 (54) 54.25

1.35199 1.07591n 1.33945 1.17464n 1.23376 1.39846n 1.~~42090~~ 21854 ~~1.08279~~ 1.34439 1.28488 1.39950n
1.45290 1.17682n 1.44036 1.27555n 1.33467 1.49937n 1.~~52089~~ 31553 1.~~17778~~ 44138 1.38187 1.49649n
+28.37 −15.03 +27.57 −18.86 +21.61 −31.58 +~~33.18~~ 20.68 −~~15.13~~ 27.63 +24.09 −31.39
54 30.72 54 29.97 54 23.02 54 21.34 54 24.46 54 25.62 54 ~~32.93~~ 20.43 54 ~~33.47~~ 20.97 54 23.04 54 22.88
+11° 28 17″.63 18.38 28 25.33 27.01 28 23.89 22.73 28 ~~15.42~~ 27.92 ~~14.88~~ 27.38 28 25.31 25.47
18.00 26.17 23.31 ~~15.15~~ 25.39
+30 43 45 44 28 43 42 44 37
1.53420 1.53450 1.53420 1.53450
−973 −389 −395 +146 −886
1.52447 1.52477 1.53031 1.53061 1.53025 1.53055 1.53566 1.53596 1.52534 1.52564
−33.46 −33.48 −33.91 −33.93 −33.90 −33.93 −34.33 −34.35 −33.52 −33.55

−.05 −.38 −.01 −.05 −.38 −.02 −.03 −.05 −.07 −.07 +.13 −.01 −.04 +.12 −.07
−.32 −.38 −.31 −.38 .00 .00 +.16 +.19 +.16 +.20
−33.83 −33.87 −34.27 −34.33 −33.93 −34.00 −34.24 −34.17 −33.40 −33.42
27 43.80 44.57 51.06 52.68 49.96 48.73 ~~47.7~~ 53.68 ~~46.7~~ 53.21 51.91 52.05
38 5.6 6.7 6.9 7.5 8.3
+10 21.8 21.1 15.8 14.0 16.9 18.2 16.3 16.8 16.4 16.8
+10 21.5 14.8 17.5 16.6 16.4
+10 22.17 38 11.76 + 16.01 14.90 11.76 + 17.85 16.74 12.30 + 15.52 14.44 10.62 + 16.68 15.64 11.75
− 1.14 21.06 12.47 − 1.11 −13.63 13.38 − 1.11 −13.83 11.07 − 1.08 −14.43 10.15 − 1.04 −15.23 11.89
+ 6.90 −12.53 + 5.80 + 5.60 + 5.00 + 4.20
+10 27.96 38 12.12 + 20.70 12.57 + 22.34 11.68 + 19.44 10.38 + 19.84 11.82
37 52.69 53.14 52.25 50.95 52.39

1875

Apr. 30	55^m	59.15^s		37'	42.6"	
May 5		59.14	-.01		43.1	+5
10		59.13	.01		43.6	5
15		59.11	.02		44.1	5
20		59.09	.02		44.6	5
25		59.06	.03		45.1	5
30		59.03	.03		45.6	5
June 4		59.00	.03		46.1	5
9		58.96	.04		46.5	4

1874.0 α	δ	1875.0 α	δ
54.24		57.27	
24		25	
29		24	
14		35	
26		25	
		24	
54.2~~34~~58		57.267	
.247	12.53	.234	53.10
+.008		+.033	

1875

-32 May 13		-32 May 17		-43 May 22		-49 May 23		-55 May 26		-44 May 29	
-.310		-.340		-.425		-.500		-.552		-.487	
55 45.0	55 35.8	55 44.6	55 33.9	55 44.9	55 47.2	55 43.8	55 35.0	55 43.3	55 38.5	55 43.5	55 36.0
47.0	37.5	46.9	36.2	46.4	49.1	45.8	36.6	45.4	40.1	45.6	38.1
49.3	37.3	48.9	37.9	48.3	51.1	47.9	38.7	47.5	42.1	47.5	40.3
53.4		52.9		52.5		52.2		51.9		51.8	
55.6		55.2		54.5		54.4		54.0		53.9	
57.5		57.2		56.8		56.4		55.9		56.0	
59.8	56 10.8	59.4	56 7.3	58.9	56 21.2	58.5	56 14.6	58.0	56 9.0	58.1	56 12.0
1.9	12.7	1.4	9.2	1.0	22.8	0.6	16.2	0.2	11.2	0.3	14.0
6.1	14.8	5.9	11.2	5.1	24.7	4.9	17.9	4.4	13.0	4.5	16.0
8.1		7.8		7.2		6.8		6.5		6.6	
10.4		9.8		9.3		9.0		8.5		8.6	
3941		3900		3841		3803		3755 6		3766	
240		240		240		240		240		240	
6341	55 37.53	6300	55 36.00	6241	55 49.13	6203	55 36.77	6156	55 40.63	6166	55 38.13
55 57.645	56 12.77	55 57.273	56 9.23	55 56.736	56 22.90	55 56.391	56 16.23	55 ~~55.955~~	56 11.07	55 56.055	56 14.00
	+1.62		+1.97		+2.49		+2.84	55.964	+3.25		+3.09
57.629	-.07	57.257	-.07	56.720	-.09	56.375	-.10	55.948	-.12	56.039	-.09
55 59.12		55 59.10		55 59.08		55 59.07		55 59.05		55 59.04	
-1.49	-1.89	-1.84	-1.87	-2.36	-1.85	-2.70	-1.84	-3.10	-1.82	-3.00	-1.81
	57.29		57.39		57.27		57.2~~7~~8 .28		57.26		57.23
+ 1.59		+ 1.93		+ 2.46		+ 2.82		+ 3.23		+ 3.11	
− .06		− .07		− .09		− .10		− .11		− .10	
− 1.89		− 1.87		− 1.85		− 1.84		− 1.82		− 1.81	
− 0.36	53 50.92	− 0.01	51.94	+ 0.52	49.73	+ 0.88	51.45	+ 1.30	50.27	+ 1.20	51.53
55 57.63	-16 5.46	55 57.26	-16 6.47	55 56.72	-16 6.57	55 56.37	-16 4.80	55 55.95	-16 3.35	55 56.04	-16 4.98
	-1.3		-1.3		-1.2		-1.3		-1.2		-1.2
55 57.27	+9.20	55 57.25	+8.80	65 67.24	+8.30	55 57.35 2	+8.20	55 57.25	+7.90	55 57.24	+7.60
	37 53.36		37 52.97		37 51.26		37 53.55		37 53.62		37 52.95
+20.11	-15.13	+21.27	-11.96	+7.61	-26.16	+19.62	-19.84	+15.33	-15.11	+17.92	-17.95
25		25		25		25		25		25	
-2.38		-2.26		-2.17		-2.13		-2.09		-2.06	
2 49.7	3 36.0	2 47.0	3 30.5	3 6.9	3 50.4	2 48.5	3 39.0	2 53.9	3 33.6	2 49.9	3 36.3
2.6	49.3	59.8	43.4	23.1	7.9	7.1	57.0	15.0	54.1	8.5	54.5
112.3	85.3	106.8	73.9	30.0	118.3	115.6	96.0	128.9	87.7	118.4	90.8
27 56.15	28 42.65	27 53.40	28 36.95	28 15.00	28 59.15	27 57.80	28 48.00	28 4.45	28 43.85	27 59.20	28 45.40
1.30341	1.17984n	1.32777	1.07773n	0.88138	1.41764n	1.29270	1.29754n	1.18554	1.17926n	1.25334	1.25406n
1.41992	1.39635n	1.44428	1.19424n	0.99789	1.53413n	1.40921	1.41405n	1.30206	1.29577n	1.36985	1.37057n
+26.30	-19.79	+27.81	-15.64	+9.95	-34.21	+25.66	-25.95	+20.05	-19.76	+23.43	-23.47
28 22.45	28 22.86	28 21.21	28 21.31	28 24.95	28 24.94	28 23.46	28 22.05	28 24.50	28 24.09	28 22.68	28 21.93
54 25.90	25.49	54 27.14	27.04	54 23.40	23.41	54 24.89	26.30	54 23.85	24.26	25.72	26.42
25.69		27.09		23.40		25.59		24.05		26.07	
44 8	44 55									44 11	44 57
~~1.53.40~~ 3.48	1.53460									1.53440	1.53460
+267		+749		-1194		-565		-995		-266	
1.53707	1.53727	1.54189	1.54209	1.52246	1.52266	1.52875	1.52895	1.52445	1.52465	1.53174	1.53194
-34.44	-34.45	-34.82	-34.84	-33.30	-33.32	-33.79	-33.80	-33.45	-33.47	-34.02	-34.04
-.04 -.32	-.02	-.05 -32	-.01	-1 -.36	-.07	-.04 -.34	-.04	-.02 -.32	-.02	-.03 .50	-.03
-26	-.33	-26	-32	-.29	-36	-.27	-34	-.28	-33	-42	-.53
-34.74	-34.80	-35.13	-35.17	-33.60	-33.75	-34.10	-34.18	-33.75	-33.82	-34.47	-34.60
53 51.16	50.65	52.01	51.89	49.80	49.66	50.79	52.12	50.10	50.44	51.25	51.82
37 43.9		44.3		44.8		44.9		45.2		45.5	
-16 3.2	6.8	7.7	7.6	5.0	4.9	5.8	7.2	4.9	5.2	5.9	6.3
-16 6.5		7.6		6.0		6.5		5.1		6.0	
-16 5.90	37 53.25	− 6.87	8.02 52.79	− 5.61	6.71 51.39	− 5.14	6.22 52.77	− 3.47	4.53 53.47	− 5.28	6.33 52.52
− 1.21	7.11 52.78	− 1.15	52.65	− 1.10	51.25	− 1.08	54.10	− 1.06	53.81	− 1.05	53.09
+ 9.20		+ 8.80		+ 8.30		+ 8.20		+ 7.90		+ 7.60	
-15 57.91	37 ~~52.51~~ 53.01	− 59.22	52.72	− 58.41	51.32	− 58.02	53.43	− 56.63	53.64	− 58.73	52.80

14 Cam. Ven. um

h m sec
12 59 59

+36° 29'

+ 5° 53'

sin z = +10

1874
λ
δ
dλ/dt
dδ/dt

l cos δ 9.90527
l 6 .10992
l 6' .01519

l 6' .01127

l sin δ 9.77422

1875
59 53.64
28 5.11
+2.818
−19.36

9.90527
.12552
.03079

corr λ =
corr δ =

tang δ = +.74

I = 2.57 s

k = −.019 s

1874 1874

May 13 May 19 May 24 May 26 June 9 June 10

−.164 −.265 ~~.268~~ −2.72 −.280 −.405

58 52.9 58 36.0 58 49.5 58 40.0 58 46.9 58 46.3 58 42.2 Ch. f. 59 41.0 59 34.2
55.4 38.5 52.1 43.0 49.4 48.9 44.9 43.5 36.6
58.1 40.5 54.8 44.8 52.0 51.4 47.0 46.1 39.2
3.1 59.8 57.2 56.5 51.2
5.7 2.3 59.8 59.0 53.8
8.3 4.9 2.4 1.6 56.3
10.9 59 16.8 7.4 59 19.4 4.9 59 24.2 4.2 59 16.2 58.9 0 15.5
13.5 19.1 10.0 22.1 7.5 26.6 6.9 19.3 1.5
18.6 21.5 15.2 24.4 12.6 29.0 11.9 22.0 6.5
21.1 17.8 15.1 14.4 9.3
23.6 20.3 17.8 16.9 11.8

2712 2941 3256 3180 3799
180 240 300 30.0 240
912 58 38.33 541 58 42.60 256 180 58 44.70 6199 59 36.67
59 8.291 59 19.13 59 4.918 59 21.97 59 2.327 59 26.60 59 1.636 59 19.17 59 56.355 0 15.50

8.272 4.899 2.308 1.617 56.336

+ 44.68 + 48.12 + 50.56 + 51.36 − 3.50
− .12 − .20 − .20 − .21 − .30
− 2.03 +0.788 − 1.98 +0.838 − 1.93 +0.888 − 1.91 +0.908 − 1.73 +1.088
+ 42.53 + 45.94 + 48.43 + 49.24 − 5.53
59 8.27 59 4.90 59 2.31 59 1.62 59 56.34

59 50.80 59 50.84 59 50.74 59 50.86 59 50.81 53.62 8
53.618 53.658 53.558 53.678
50.810

+29.96 −10.84 +22.32 −17.05 −24.27 +16.94 −17.53 +19.68 −19.15
0 0 0 0 0 0
−2.18 −2.20 −2.19 −2.18 −2.04

3 0.4 4 41.9 3 5.7 4 47.9 4 53.8 4 12.5 4 48.7 3 2.8 4 54.0 4 6.0 4 46.9
19.0 1.4 10.0 52.0 1.7 17.2 54.7 19.2 11.9 16.1 55.2
19.4 103.3 15.7 99.9 115.5 29.7 103.4 22.0 125.9 22.1 102.1
3' 9.70" 4 51.66 3 7.85 4 49.95 4 57.75 4 14.85 4 51.70 3 11.00 5 2.95 4 11.05 4 51.05
(4) (4)

1.47654 1.03503n 1.34869 1.23172n 1.38507n 1.22891 1.24378n 1.29403 1.28217n
1.49173 1.05022 1.36388 1.24691n 1.40026n 1.24410 1.25897n 1.30530 1.29344n
+31.03 −11.23 +23.11 −17.66 − 25.14 +17.54 −18.15 +20.20 −19.65
4 40.73 4 40.43 4 30.96 4 32.29 4 32.61 4 32.39 4 33.55 4 31.25 4 31.40

+36°
18 7.62" 7.92 18 17.39 16.06 18 15.74 18 15.96 14.80 18 17.10 16.95
7.77 16.72 15.38 17.02

+5 53 53 54 35 53 54 54 34
0.77450 0.77530 0.77450 0.77530
959 +88 −370 −379 867
.76491 .76571 .77538 .77618 .77080 .77160 .77071 .77151 .76583 .76663
− 5.82 − 5.83 − 5.96 − 5.97 − 5.90 − 5.91 − 5.90 5.91 − 5.83 − 5.84

−.24 −.50 −.03 −.13 −.46 −.08 −.15 −.54 −.07 −.07 −.08 −.10 +.08 −.09
−.34 −.20 .39 −.33 −.38 −.39 −.39 .00 .00 +17 +19
− 6.40 − 6.25 − 6.42 − 6.43 − 6.45 − 5.97 − 5.99 − 5.76 − 5.74
+36 18 1.22 1.67 18 10.97 9.63 18 9.29 18 9.99 8.81 18 11.34 11.21
+ 10 22.17 22.15 + 16.07 16.05 +16.01 15.99 + 17.85 19.83 + 16.68 16.66
− .02 −18.23 − .02 −19.33 − .02 −20.18 − .02 −20.50 − .02 −22.61
+ 1.13 +0.03 −0.82 −1.14 − 3.25
+ 10 23.28 28 24.50 + 16.08 27.05 + 15.17 + 16.69 26.68 + 13.41 24.75
24.95 25.71 25.50 24.62

28 24.72 26.38 24.46 26.09 24.68
28 5.36 7.02 5.10 ~~6.23~~ 6.73 5.32

1875

	May 22				May 23				May 26				May 29				June 8		
	-.425				-.500				-.552				-.488				-.485		
59	38.4	59	28.2	59	38.0	59	35.2	59	37.6	59	26.7	59	37.7	59	27.3	59	38.6	59	33.0
	40.9		30.3		40.6		37.2		40.3		29.1		40.3		29.8		41.1		35.0
	43.5		32.8		43.1				42.9		30.8		42.8		31.7		43.7		37.1
	48.7				48.3				47.9				48.0				48.9		
	51.2				50.7				50.5				50.5				51.5		
	53.7				53.4				53.0				53.1				54.0		
	56.2	0	13.0		55.9	0	13.6		55.6	0	6.4		55.7	0	16.0		56.5		
	58.9				58.5		15.4		58.2		9.0		58.3		18.8		59.2	0	11.8
0	4.1				3.7		17.0		3.3		10.5		3.2		20.8		4.3		14.2
	6.5				6.2				6.0				5.8				6.8		16.7
	9.2				8.7				8.6				8.5				9.3		
	4113				4071				4039				4039				4139		
	180				180				180				180				180		35.03
	5913	59	30.43		5871	59	36.20		5839	59	28.87		5839	59	29.60		5939	59	~~35.13~~
59	53755	0	13.00	59	53373	0	15.33	59	53082	0	8.63	59	53082	0	18.53	59	53.991	0	14.23
	53.736				53.354				53.063				53.063				53.972		
+	2.46			+	2.82			+	3.23			+	3.11			+	2.12		
—	.31			—	.37			—	.41			—	.36			—	.36		
—	2.31			—	2.30			—	2.27			—	2.23			—	2.12		
—	0.16			+	0.15			+	0.55			+	0.52			—	0.36		
59	53.74			59	53.35			59	53.06			59	53.06			59	53.97		
59	53.58			59	53.50			59	53.61			59	53.58			59	53.61		
																	53.576		
	+23.32		-19.25		+17.17		-21.96		+24.21		-15.55		+23.48		-25.45		+18.96		-20.24
35				35				35				35				35			
1	-2.17				-2.13				-2.09				-2.06				-1.96		
2	59.5	3	43.9	3	3.9	3	45.4	2	57.2	3	38.7	2	56.4	3	48.1	2	59.2	3	41.7
	18.8		4.7		24.5		7.0		20.0		2.1		17.6		10.0		20.6		4.7
.	1383		1086		284		1124		1372		1008		1840		1181		1898		1064
38	9.15	38	54.30	38	14.20	38	56.20	38	8.60	38	60.40	38	7.00	38	59.05	38	9.90	38	53.20
	1.36773		1.28443$_n$		1.23477		1.34163$_n$		1.38399		1.19173$_n$		1.37070		1.40569$_n$		1.27784		1.30621$_n$
	1.39852		1.31522$_n$		1.27556		1.37242$_n$		1.41478		1.22252$_n$		1.40149		1.43648$_n$		1.30863		1.33700$_n$
	+25.03		-20.66		+18.86		-23.57		+25.99		-16.69		+25.20		-27.32		+20.35		-21.73
38	34.18	38	33.64	38	33.06	38	32.63	38	34.07	38	33.71	38	32.20	38	31.73	38	30.25	38	31.47
44	14.17		14.71	44	15.29		15.72	44	13.76		14.64	44	16.15		16.62	44	18.10		16.88
	14.44				15.50				14.20				16.38				17.49		
54	21	55	6													54	22	55	5
	0.77510		0.77590														0.77510		0.77590
	-1163				-550				-971				-252				-373		
	.76347		.76420		.76960		.77040		.76539		.76619		.77258		.77338		.77137		.77217
	-5.80		-5.81		-5.88		-5.89		-5.83		-5.84		-5.92		-5.93		-5.91		-5.91
	-.14	-.44	-.10		-.07	-.42	-.13		-.15	-.41	-.06		-.14	-.65	-.17		-.10	-.60	-.10
	-.29		-.35		-.29		-.35		-.28		-.34		-.43		-.56		-.45		-.55
	-6.23		-6.26		-6.24		-6.37		-6.26		-6.24		-6.49		-6.66		-6.46		-6.56
44.	7.94		8.45	44	9.05		9.35	44	7.50		8.40	44	9.66		9.96	44	11.64		10.32
-16	5.61	5.63		—	5.14	5.16		—	3.47	3.49		—	5.28	5.30		—	5.73	5.75	
	.02			—	.02			—	.02			—	.02			—	.02		
—	+1.88				+1.75				+1.35				+0.93				-0.67		
-16	3.75		4.19	—	3.41		5.64	—	2.14		5.36	—	4.37		5.29	—	6.42		5.22
			4.70				5.94				6.26				5.59				3.90
			4.45				5.79				5.81				5.44				4.56

β Virginis 06
13 3 29
— 4° 52′
φ + 47° 15′
sin z = +.73

corr α = −.026 s
corr δ = +.80″
Longd. = −.09 s
I = 2.97 s
K = −.015 s

1874		m s		′ ″	
May 20	3	27.07		51 68.1	
25		27.05	−.02	67.9	−.2
30		27.02	.03	67.7	.2
June 4		26.99	.03	67.5	.2
9		26.96	.03	67.3	.2
14		26.93	.03	67.1	.2
19		26.89	.04	66.8	.3
24		26.85	.04	66.5	.3
29		26.80	.05	66.2	.3

	1874	1875
α	25.644 s	28.744
δ	−51 57.45″	−52 16.78
dα/dt	+3.100	+3.100
dδ/dt	−19.329	−19.328
l cos δ	9.99843	9.99843
l b	.10992	.12552
l b′	.10835	.12395

l b′ .10443
l sin δ 8.92859n

X 1874 May 19 −.18 −.08		X May 24 −.28		X May 26 −.28		X 1874 June 10 −.45		−.32 1875 May 17		−.43 May 22	
−.265		~~−.268~~ −2.72		−.280		−.405		−.340		−.425	
13 2 26.6	2 21.0	2 24.1	2 14.2	2 23.3	2 6.1	3 18.1	3 12.4	3 16.1	3 6.7	3 15.5	3 41.1
28.7	23.3	26.1	17.0	25.3	8.0	20.1		18.1	8.5	17.6	42.6
30.7	25.7	28.2	18.7	27.4	9.7	22.1		20.3	10.3	19.8	45.1
34.8		32.3		31.5		26.3		24.4		23.8	
36.9		34.4		33.6		28.5		26.4		25.9	
39.0		36.5		35.6		30.5		28.4		28.0	
41.1	3 0.2	38.6	2 54.8	37.8	2 57.3	32.5	3 59.1	30.6	3 39.8	30.2	
43.2		40.6		39.8	53.3	34.6	0.6	32.6	41.9	32.2	
47.3		44.7		43.8	55.1	38.6	2.2	36.7	43.3	36.3	
49.3		46.8		46.0		40.8		38.8		38.3	
51.4		48.9		48.1		43.0		41.0		40.5	
42.90	2 23.33	40.12	2 16.63	39.22	2 7.93	33.51	3 12.40	31.34	3 8.50	30.81	3 42.93
2 39.000	3 0.20	2 36.473	2 54.80	2 35.655	2 53.23	3 30.464	4 0.63	3 28.491	3 41.67	3 28.009	
38.985		36.458		35.640		30.449		28.476		27.994	
3 27.07	+48.18	3 27.05	+50.56	3 27.04	+57.36	3 26.95	−3.47	3 30.49	+1.97	3 30.47	+2.50
−48.09	+.02	−50.59	+.03	−51.40	+.03	~~−56.50~~ +3.50	+.04	−2.01	+.03	−2.48	+.04
−48.06		−50.56		−51.37		~~−56.47~~ +3.53		−1.98		−2.45	
	−1.43		−1.41		−1.40		−1.31		−1.75		−1.73
+ 48.12	3 25.75	+ 50.56	25.64	+ 51.36	25.63	− 3.50	25.71	+ 1.93	28.73	+ 2.46	28.50
+ .02		+ .02		+ .02		+ .04	2	+ .03		+ .04	
− 1.43	+1.670	− 1.41	+1.690	− 1.40	+1.700	− 1.31	+1.790	− 1.75	+~~1.350~~	− 1.73	
+ 46.71		+ 49.17		+ 49.98		− 4.77		+ 0.21		+ 0.77	
2 38.98	2 21.33	2 36.46	22.46	2 35.64	22.79	3 30.45	2 23.06	3 28.48	36 21.03	3 27.99	24.12
	+10 16.17		+10 16.26		+10 17.66		+10 17.28		−16 6.47		−16 5.57
3 25.69	−1.6	3 25.63	−1.5	3 25.62	−1.5	3 25.68	−1.4	3 28.69	−1.7	3 28.76	−1.7
28.790	+10.70	28.730	+10.50	28.720	+10.50	28.780	+9.90	~~7.40~~	+13.60		+12.80
−4	51 56.06		51 57.20		51 56.13		51 57.28		52 16.20		52 18.59
20 + 15.67	−21.20	20 + 19.84	−18.33	20 + 27.72	−17.58	20 + 18.06	−30.17	55 + 19.99	−13.18	55 − 14.92	
1 − 2.20		− 2.19		− 2.18		− 2.04		− 2.26		− 2.17	
3 42.7	4 30.1	3 37.5	4 26.9	3 29.0	4 25.9	3 40.7	4 41.9	2 33.3	3 17.0	3 22.9	3 39.5
50.5	39.1	49.2	37.8	40.2	36.9	54.9	55.9	45.7	29.1	40.0	55.0
93.2	69.2	86.7	64.7	69.2	62.8	95.6	97.8	79.0	46.1	62.9	94.5
23 46.60	24 34.60	23 43.35	24 32.35	23 34.66	24 31.40	23 47.80	24 48.90	57 39.50	58 23.05	58 31.45	58 47.25
1.19507	1.32634n	1.29754	1.26316n	1.44279	1.24502n	1.25672	1.47958n	1.30081	1.11992n	1.17877n	
1.30342	1.43469n	1.30589	1.37151n	1.55114	1.35337n	1.36115	1.58401n	1.42476	1.24387n	1.29772n	
20.11	−27.21	+20.~~46~~	−23.52	+35.58	−22.56	+22.97	−38.38	+26.59	−17.53	−19.85	
24 6.71	24 7.39	24 ~~3.57~~ 8.81	24 8.83	24 10.18	24 8.84	24 10.77	24 10.52	58 6.09	58 5.52	58 11.60	
−5° 1 18.36	19.04	1 ~~15.22~~ 20.46	20.48	1 21.83	20.49	1 22.42	22.17	35 17.74	17.17	35 23.25	
18.70		20.47		21.16		22.29		17.45			
+47 13 30	14 18					13 31	14 32	13 51	14 35		
1.79350	1.79370					1.79350	1.79370	1.79360	1.79380		
+101		−353		−365		−851		+780		−1136	
1.79451	1.79471	1.78997	1.79017	1.78985	1.79005	1.78499	1.78519	1.80140	1.80160	1.78224	1.78244
−62.30	−62.33	−61.66	−61.69	−61.64	−61.67	−60.95	−60.98	−63.30	−63.33	−60.57	−60.60
.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
+.01	−32 +.02	+.02	−31 +.01	+.04	+.02 +.01	+.01	+20 +.04	+.02	−26 +.01	+.01	−30
−.30	−.37	−.30	−.36	.00	.00	+.15	+.19	−.24	−.31	−.31	−.34
−1 2.59	−1 2.68	−1 1.94	−1 2.04	−1 1.60	−1 1.66	−1 0.79	−1 0.75	−1 3.52	−1 3.63	−1 0.87	
2 20.55	21.72	22.40	22.52	23.43	22.15	23.21	22.92	36 21.26	20.80	29.12	
52 8.1		7.9		7.9		7.3		52 29.8		29.6	
+10 12.8	13.6	14.5	14.6	15.5	13.3	15.5	15.6	−16 7.5		3.5	
+10 13.2		14.5		14.4		15.7		−16 ~~8.2~~		5.5	
+10 14.0	51 55.78	15.3	~~57.39~~ 57.48	15.2	56.67	16.5	58.11	7.4	52 16.41	4.7	
+10 16.07	14.47 56.55	+ 16.01	14.42 ~~57.57~~ 57.60	+ 17.85	15.26 55.39	+ 16.68	15.20 57.82	−16 6.87	8.51 16.31	− 5.61	7.19
− 1.60	−8.63	− 7.59	−8.83	− 1.59	−8.83	− 1.48	−9.43	− 1.64		− 1.58	
+ 10.70	51 56.16	+ 10.50	~~57.45~~ 57.54	+ 10.50	56.03	+ 9.90	57.96	+ 13.00	52 16.54	+ 12.80	18.51
+ 10 25.17	52 15.49	+ ~~25.01~~ 24.92	~~16.78~~ 16.87	+ 26.76	15.36	+ 25.10	17.29	15 55.51		− 54.39	

1875

		m s		′ ″	
May.	20	3 30.48		52 29.7	
	25	30.46	−.02	29.5	−.2
	30	30.44	.02	29.3	.2
June	4	30.41	.03	29.1	.2
	9	30.38	.03	28.9	.2
	14	30.35	.03	28.7	.2
	19	30.31	.04	28.4	.3
	24	30.27	.04	28.2	.2
	29	30.22	.05	27.9	.3

−49
May 23
−500

3	15.3	3	14.0
	17.4		15.8
	19.5		17.6
	23.5		
	25.6		
	27.6		
	29.7	3	45.9
	31.9		47.3
	35.9		49.2
	38.0		
	40.0		
	30.44	3	15.80
3	27.673	3	47.47
	27.658		
3	30.47		+2.84
	−2.81		+.04
	−2.78		
			−1.73
+	2.82		28.81
+	.04		
−	1.73		
+	1.13		
3	27.66		22.10
		−16	4.80
3	28.79		−1.6
			+13.80
		52	15.70
	+11.87		−19.80
55			
1	−2.13		
2	43.5	3	26.5
	1.4		44.7
	104.9		71.2
57	52.45	58	35.60
	1.07445		1.29667
	1.19840		1.42062
	+15.79		−26.34
58	8.24	58	9.26
35	19.89		20.91
	20.40		
	−5.36		
	1.78824		1.78844
	−61.41		−61.44
	.00		.00
	−.01	−.27	+.02
	−.26		−.32
−1	1.66	−1	1.74
	21.55		22.65
	29.6		
	8.1		7.0
	7.5		
	6.7		15.44
−16	5.14	6.69	16.54
−	1.55		
+	12.80		15.99
−	52.84		

−55
May 26
−55.2

3	14.8	3	6.8
	16.9		8.7
	19.0		10.8
	23.1		
	25.1		
	27.3		
	29.2	3	45.5
	31.4		47.7
	35.4		49.3
	37.6		
	39.6		
	29.94	3	8.77
3	27.218	3	47.50
	27.203		
3	30.46		+3.25
	−3.26		+.05
	−3.23		
			−1.72
+	3.23		28.78
+	.05		
−	1.72		
+	1.56		
3	27.20		23.04
		−16	3.35
3	28.76		−7.7
			+12.70
		52	15.39
	+18.45		−20.28
55			
	−2.09		
2	35.2	3	26.9
	55.9		48.0
	91.1		74.9
57	45.55	58	37.45
	1.26600		1.30707
	1.38995		1.43162
	+24.55		−26.98
58	10.10	58	10.47
35	21.75		22.12
	21.93		
	−9.52		
	1.78408		1.78428
	−60.82		−60.85
	.00		.00
	+.01	−.27	+.02
	−.25		−.32
−1	1.06	−1	1.15
	22.81		23.27
	29.5		
	6.7		6.2
	6.5		
	5.7		15.10
−	3.47	4.99	15.56
−	1.52		
+	12.70		15.33
−	52.29		

−44
May 29
−48.8

3	14.9	3	6.6
	17.0		8.6
	19.2		10.4
	23.2		
	25.3		
	27.5		
	29.4	3	45.3
	31.6		47.5
	35.6		49.3
	37.8		
	39.8		
	30.13	3	8.53
3	27.391	3	47.37
	27.376		
3	30.44		+3.09
	−3.06		+.04
	−3.03		
			−1.70
+	3.11		28.81
+	.04		
−	1.70		
+	1.45		
3	27.37 8		21.62
		−16	4.98
3	28.82 3		−1.6
			+13.50
		52	15.70
	+18.86		−19.98
55			
	−2.06		
2	33.1	3	24.7
	51.9		44.1
	85.0		68.8
57	42.50	58	34.40
	1.27554		1.30060
	1.39949		1.42453
	+25.09		−26.58
58	7.59	58	7.82
35	19.24		19.47
	19.35		
	−2.39		
	1.79121		1.79141
	−61.83		−61.86
	.00		.00
	+.01	−.42	+.02
	−.38		−.50
−1	2.20	−1	2.34
	21.44		21.81
	29.3		
	7.9		7.5
	4.7		
	6.9		15.72
−	5.28	6.78	16.09
−	1.50		
+	12.50		15.90
−	54.28		

−50
June 8
−48.5

3	15.8	3	5.6
	18.0		7.9
	25.0		9.7
	24.2		
	26.1		
	28.2		
	30.2	3	44.7
	32.4		46.7
	36.4		48.4
	38.6		
	40.7		
	31.06	3	7.73
3	28.236	3	46.60
	28.221		
3	30.39		+2.12
	−2.17		+.05
	−2.14		
			−1.65
+	2.12		28.74
+	.04		
−	1.65		
+	0.51		
3	28.22		21.45
		−16	5.59
3	28.73		−1.6
			+12.10
		52	16.54
	+20.51		−18.36
55			
	−1.96		
2	30.5	3	22.1
	51.0		41.5
	81.5		63.6
57	40.75	58	31.80
	1.31197		1.26387
	1.43592		1.38782
	+27.29		−24.47
58	8.04	58	7.38
35	19.69		19.03
	19.36		
13	53	14	44
	1.79360		1.79380
	−3.58		
	1.79002		1.79022
	−61.66		−61.69
	.00		.00
	+.02	−.42	+.01
	−.38		−.49
−1	2.02	−1	2.17
	21.7		21.20
	28.9		
	7.2		7.7
	7.0		
	6.7		16.77
−	5.73	7.16	16.26
−	1.43		
+	12.10		16.82
−	55.06		

(6) 43 Comae.
$13^h\ 6^m\ 2^{sec}$
+28° 31′
z = +43 52
sin z = + ~~.34~~ .24
cos α =
cos δ =
tang δ = +.54
I = 2.35 s
K = −.018 s

1874				
May 20	5^m 61.34 s		30′ 61.0″	
25	61.30	−.04	61.8	+.8
30	61.26	.04	62.6	.8
June 4	61.21	.05	63.3	.7
9	61.16	.05	63.9	.6
14	61.11	.05	64.4	.5
19	61.05	.06	64.9	.5
24	60.99	.06	65.3	.4
29	60.93	.06	65.7	.4

	1874	1875
α	59.536 s	2.343
δ	+31 2.94″	+30 44.61
dα/dt	+2.807 s	+2.807
dδ/dt	−18.333″	−18.332
l cos δ	9.94383	9.94383
l c	.10992	.12552
l c′	.05375	.06935
l c	.04983	
l sin δ	9.67890	

1874 × −.18 −.08 May 19 −.265		× −.28 May 24 ~~−.268~~ −2.72		× −.28 May 26 −.280		−.42 June 9		× −.45 June 10 −.405		× −.38 June 17 −.410	
13 4 59.2	4 57.5	4 56.9	4 42.1	4 56.1	4 49.0	Ch. f.		5 50.7	5 40.6	5 60.6	5 40.4
5 1.7	54.0	59.2	44.2	58.4	57.0			53.2	42.9	63.0	42.4
4.1	53.8	1.5	45.7	0.7	53.1			55.5	44.9	66.3	44.1
8.6		6.2		3.4				0.0		0.0	
11.0		8.5		7.8				2.5		2.5	
13.3		10.9		10.1				4.8		4.7	
15.6 5	30.1	13.2 5	31.6	12.4 5	30.6			7.2 6	29.8	7.0 6	21.0
18.2	32.8	15.6	34.0	14.8	32.5			9.5	32.2	9.3	23.6
22.8	35.1	20.3	35.8	19.5	35.0			14.2	35.3	14.0	25.5
25.1		22.5		21.7				16.6		16.4	
27.4		25.0		24.2				18.9		18.8	
				2311							
2070		2398		~~2291~~				2331		2316	
60		120		120				180		180	
147	4 53.77	1198	4 44.00	1191	4 51.03			531	5 42.80	516	5 42.30
5 13.364	5 32.67	5 10.891	5 33.80	5 ~~9.918~~	5 32.70			6 4.827	6 32.43	6 4.691	6 23.37
	+48.18		+50.56	10.100	+57.36				−3.47		−3.47
13.346	−.10	10.873	−.15	10.082	−.15			4.809	−.24	4.673	−.21
6 1.35		6 1.31		6 1.29				6 1.15		6 1.07	
−48.00	−1.81	−50.44	−1.77	−51.21	−1.75			+3.66	−1.61	+3.60	−1.53
~~6~~ 5 5	59.62		59.51		59.54				59.49		59.46
+ 48.12		+ 50.56		+ 51.36				− 3.50		− 3.37	
− .14		− .15		− .15				− .22		− .22	
− 1.81	+0.997	− 1.77	+1.037	− 1.75	+1.037			− 1.61	+1.197	− 1.53	+1.277
+ 46.17	20 46.07	+ 48.64	45.36	+ 49.46	44.67			− 5.33	97 46.62	− 5.12	20 49.06
5 13.35	+10 16.17	5 10.87	+10 16.26	5 10.08	+10 17.66			6 4.81	+10 17.28	6 4.67	+10 16.13
	−.5		−.4		−.4				−.4		−.4
5 59.62	+2.00	5 59.51	+1.20	5 59.54	+0.90			5 59.48	−1.10	5 59.55	−1.80
~~2.427~~	28 31 3.74	2.317	31 2.42	2.347	31 2.83			2.287	31 2.75	59.540	31 2.357 2.99
2.327				19.07	22.60						
+19.59	−19.31	+26.89	−22.91	+ ~~18.89~~	− ~~22.78~~			+22.03	−27.60	+22.99	−18.68
0		0		0		0		0		0	
1 −2.20		−2.19		−2.18				−2.04		−1.93	
1 23.3	2 7.3	1 14.9	2 11.3	1 25.0	2 12.1	1 21.7		1 17.9	2 14.1	1 16.1	1 2.3
27.5	12.5	20.4	16.9	30.9	18.0	39.7		27.0	23.1	25.4	11.2
50.8	19.8	35.3	28.2	55.9	30.1	61.4		44.9	37.2	41.5	13.5
1′ 25.40″	2 9.90	1 17.65	2 14.10	1 27.95	2 15.05	1 30.70		1 22.45	2 18.60	1 20.75	1 6.75 (2)
1.29208	1.28578n	1.42959	1.36003	1.28035	1.35411n			1.34301	1.44091	1.35005	1.27138n
1.34578	1.33953n	1.48334	1.41378	1.33410	1.40786n			1.39284	1.49074	1.39988	1.32121n
+22.17	−21.85	+30.43	−25.93	+21.58	−25.58			+24.71	−30.96	+25.11	−20.95
1 47.57	1 48.05	1 48.08	1 48.17	1 49.53	1 49.47			1 47.16	1 47.64	45.86	1 45.80
+28° 21 0.78″	0.30	20 59.27	0.18	20 58.82	58.88			21 1.19	0.71	21 2.49	2.55
0.54		59.72		58.85				0.95		2.52	
~~+~~ 13 51 8	51 53									51 21	51 50
1.15230	1.15260									1.15240	1.15260
+109		−342		−356				−840		−2113	
1.15339	1.15369	1.14888	1.14918	1.14874	1.14904			1.14390	1.14420	1.13127	1.13147
−14.24	−14.25	−14.09	−14.10	−14.08	−14.09			−13.93	−13.94	−13.53	−13.54
−.08 −.22	−.08	−.15 −.27	−.11	−.08 −.09	−.11			−.09 −.04	−.14	−.09 +.08	−.06
−.11	−.18	−.10	−.18	.00	.00			+.06	+.09	+.12	+.19
−14.43	−14.51	−14.34	−14.39	−14.16	−14.20			−13.96	−13.89	−13.50	−13.41
20 46.35	45.79	44.53	45.79	44.66	44.68			47.23	46.92	48.99	49.14
31 0.9		1.7		2.0				4.0		4.7	
+10 14.6	15.1	16.8	15.9	17.3	17.3			16.8	17.8	15.7	15.6
+10 14.9		16.3		17.3				17.0		18.7	
+10 16.07	31 3.89	+ 16.01	15.49 ~~0.86~~ 1.62	+ 17.85	17.33 2.89			+ 16.68	16.20 2.33	+ 16.40	15.94 3.13
− 53	15.54 3.33	− .52	−17.13 ~~1.12~~ 2.48	− .52	−17.43 2.91			− .48	−19.43 1.82	− .46	−20.13 3.28
+ 2.00	−16.33	+ 1.20		+ 0.90				− 1.10		− 1.80	
+10 17.54	31 3.61	+ ~~15.35~~ 16.69	~~0.69~~ 2.05	+ 18.23	2.90			+ 15.10	2.07	+ 14.14	3.20
	30 45.28		~~42.36~~ 43.72		44.57				43.74		44.84

1875

May 20	6 m	4.49		30 '	40.3 "	
25		4.45	-.04		41.1	+8
30		4.41	.04		41.9	8
June 4		4.36	.05		42.6	7
9		4.31	.05		43.2	.6
14		4.26	.05		43.7	5
19		4.21	.05		44.2	5
24		4.15	.06		44.6	4
29		4.09	.06		45.0	4

1875

-.43 May 22 -.425		-.49 May 23 -.500		-.55 May 26 -.552		-.44 May 29 -.488		-.50 June 8 -.485	
5 48.1	5 40.7	5 47.7	5 33.0	5 47.4	5 36.4	5 47.4	5 36.7	5 48.3	5 35.4
50.4	42.5	50.2	35.5	49.8	38.4	49.9	38.6	50.7	37.6
52.8	44.6	52.3	37.8	52.2	40.3	52.2	40.2	53.0	39.6
57.5		57.1		56.8		56.7		57.7	
59.9		59.4		59.1		59.1		6 0.1	
6 2.2		6 1.8		6 1.4		6 1.6		2.4	
4.5	6 23.9	4.0	6 21.4	3.8	6 12.0	3.9	6 23.7	4.8	6 21.3
6.9	26.2	6.6	24.0	6.2	13.6	6.2	25.3	7.2	23.8
11.6	28.3	11.2	25.8	11.0	15.8	10.9	27.2	11.9	25.4
13.9		13.6		13.1		13.2		14.2	
16.2		16.0		15.5		15.7		16.5	
40									
32 ~~32~~		32.01		31.63		31.68		26.68	
30 0		30 0		30 0		30 0		24 0	
2 40	5 42.60	2 01	5 35.33	1 63	5 38.37	1 68	5 38.50	2 68	5 37.53
6 ~~2.109~~	6 26.13	6 1.827	6 23.73	6 1.482	6 13.80	6 1.527	6 ~~25.53~~	6 2.436	6 23.50
~~2.182~~	+2.50		+2.84		+3.25		25.20		+2.12
2.164	-23	1.809	-26	1.464	-30	1.509	+3.10	2.418	-27
6 4.47		6 4.476		6 4.44		6 4.42	-24	6 4.32	
-2.31	-2.13	-2.685	-2.12	-2.98	-2.10	-2.91	-2.08	-1.90	-1.98
	6m 5 ~~2.2~~ 30 30		2.27		2.31		2.29		2.29
+ 2.46		+ 2.82		+ 3.23		+ 3.11		+ 2.12	
− .23		− .27		− .30		− .26		− .26	
− 2.13		− 2.12		− 2.10		− 2.08		− 1.98	
+ 0.10	46 43.50	+ 0.43	45.34	+ 0.83	44.79	+ 0.77	46.76	− 0.12	48.32
6 2.16	-16 5.57	6 1.81	-16 4.80	6 1.46	-16 3.35	6 1.51	-16 4.98	6 2.42	-16 5.59
	-.6		-.6		-.6		-.6		-.6
6 2.26	+ 3.90	6 2.24	+ 3.80	6 2.29	+ 3.30	6 2.28	+ 2.80	6 2.30	+ 1.50
	30 43.23		30 43.74		30 44.14		30 43.98	2.274	30 ~~63.63~~ 43.63 43.
+19.58	-23.95	+$\overset{2}{3}$6.50	-21.90	+23.11	-12.32	+23.03	-23.67	+24.91	-21.06
35		35		35		35		35	
-2.17		-2.13		-2.09		-2.06		-1.96	
0 15.1	1 6.8	0 6.5	1 3.0	0 8.7	0 51.6	0 9.0	1 4.0	0 4.9	0 58.7
36.5	27.1	28.9	25.9	35.6	16.8	31.0	26.4	28.3	21.9
51.6	33.9	35.4	28.9	44.3	128.4	40.0	30.4	33.2	140.6
35 25.80	36 16.95	35 17.70	36 14.45	35 22.15	36 4.20	35 20.00	36 15.20	35 16.60	36 10.30
1.29181	1.37931	1.42325	1.34044	1.36380	1.09061	1.36229	1.37420	1.39637	1.32346
1.36116	1.44866	1.49260	1.40979	1.43315	1.15996	1.43164	1.44355	1.46572	1.39281
+22.97	-28.10	+31.09	-25.69	+27.11	-14.45	+37.02	-27.77	+29.22	-24.71
35 48.77	35 48.85	35 48.79	35 48.76	35 49.26	35 49.75	35 47.02	35 47.48	35 45.82	35 45.59
46 59.58	59.50	46 59.56	59.59	46 59.09	58.60	47 1.33	0.92	47 2.53	2.76
59.54		59.57		58.84		1.12		2.64	
51 38	52 29							51 29	52 22
1.15250	1.15300							1.15250	1.15290
-1118		-527		-939		-231		-348	
1.14132	1.14182	1.14723	1.14773	1.14311	1.14361	1.15019	1.15069	1.14902	1.14942
-13.85	-13.86	-14.03	-14.05	-13.90	-13.92	-14.13	-14.15	-14.09	-14.11
-.08 -18	-.12	-.15 -.19	-.10	-.12 -.14	-.03	-.12 -.22	-.12	-.13 -.22	-.10
-.04	-.12	-.03	-.11	-.04	-.10	-.04	-.17	-.04	-.17
-13.97	-14.10	-14.21	-14.26	-14.06	-14.05	-14.29	-14.44	-14.26	-14.38
46 45.61	45.40	45.35	45.33	45.03	44.55	47.00	46.48	48.39	48.38
40.7		40.8		41.3		41.8		43.1	
-16 ~~4.7~~	4.7	4.6	4.5	3.7	3.2	5.2	4.7	5.2	5.3
-16 4.8		4.6		3.5		4.9		5.2	
-16 5.61	6.13 43.38	− 5.14	5.65 43.50	− 3.47	3.97 44.36	− 5.28	5.71 44.07	− 5.73	6.20 43.57
− .52	43.17	− .51	43.48	− .50	43.88	− .49	43.51	− .47	43.6
+ 3.90		+ 3.80		+ 3.30		+ 2.80		+ 1.50	
-16 2.23	30 ~~42.77~~ 43.27	− 1.85	43.19	− 0.67	44.12	− 2.97	43.19	− 4.70	43.62

11 H. Canum

~~Piazzi XIII, 27~~
~~B.A.C. 4433.~~
h m sec.
13 8 0
+40° 49′
z + 1° 34′
δ sin z = +.03

1874	1875
α	8 2.76
δ	48 55.13
dα/dt	+2.731
dδ/dt	−19.16
l cos δ 9.87898	9.87898
l 6 .10992	.12552
l 6′ 9.98890	.00450
l 6′ 9.98498	
l sin δ 9.81534	

cos α =
cos δ =
tang δ = +.86
I = $2.^{s}72$
k = $-0.^{s}20$

1874

May 19		May 24		May 26		June 9	June 10		June 17	
−.265		~~−.268~~ −2.72		−.280			−.405		−.410	
13 6 37.9	6 43.3	6 55.5	6 44.5	6 54.6	6 46.4	Clo. f.	7 49.5	7 40.2	7 49.2	7 38.3
7 0.6	45.9	58.2	47.0	57.3	49.1		52.2	43.0	51.9	41.0
3.4	48.3	0.9	49.0	0.1	51.2		54.9	46.5	54.7	43.3
8.8		6.3		5.4			0.2		0.0	
11.6		9.1		8.3			3.2		2.8	
14.3		10.7		11.0			5.8		5.5	
16.9	7 32.3	14.5	7 24.7	13.7	7 25.5		8.5	8 32.7	8.3	8 31.3
19.7	34.9	17.2	27.4	16.6	28.6		11.1	34.5	11.0	33.5
25.2	37.7	22.8	29.5	21.8	30.8		16.6	36.6	16.4	35.6
27.9		25.4		24.6			19.5		19.2	
30.7		28.1		27.4			22.2		21.9	
2170		2497		2408			2437		24~~11~~ 09	
60		120		120			180		180	
1570	6 45.83	1297	6 46.83	1208	6 48.90		637	7 43.23	609	7 41.20
7 14.273	7 34.97	7 11.791	7 27.20	7 10.982	7 28.30		8 5.791	8 34.60	8 ~~5.555~~ 5.536	8 33.47
14.253		11.771		10.962			5.771		5.516	
+ 48.12		+ 50.56		+ 51.36			− 3.50		− 3.37	
− .23		− .23		− .24			− .35		− .35	
− 2.13 +0.601		− 2.08 +0.651		− 2.06 +0.671			− 1.87 +0.861		− 1.77 +0.961	
+ 45.76		+ 48.25		+ 49.06			− 5.72		− 5.49	
7 14.25		7 11.77		7 10.96			8 5.77		8 5.52	
8 0.01		8 0.02		8 0.02			8 0.05		8 0.03 2.761	
~~2.841~~ 2.741		2.751		2.751			2.781		0.046	

May 19		May 24		May 26		June 9		June 10		June 17	
+28.44	−20.70	+24.96	−15.41	+22.08	−17.32			+22.56	−28.81	+24.~~85~~ .34	−27.9~~2~~ 3
40		40		40		40		40		40	
−2.20		−2.19		−2.18				−2.04		−1.93	
3 17.5	3 5.1	3 20.1	3 0.0	3 23.9	3 1.9	3 21.0	4 22.1	3 22.1	4 11.3	3 15.8	4 7.8
22.5	9.3	27.0	5.8	29.8	8.0	38.7	39.0	31.7	20.0	25.9	16.0
40.0	14.4	47.1	5.8	53.7	9.9	59.7	61.1	53.8	31.3	41.7	23.8
43 20.00	43 7.20	43 23.55	43 2.90	43 26.85	43 4.95	43 29.85	44 30.55	43 26.90	44 15.65	43 20.85	44 11.90
1.45393	1.31597n	1.39724	1.18780n	1.34400	1.23855n			1.35334	1.45954n	1.38632	1.44607n
1.44283	1.30487n	1.38614	1.17670n	1.33290	1.22745n			1.33832	1.44452n	1.37130	1.43165n
+27.72	−20.18	+24.33	−15.02	+21.52	−16.88			+21.79	−27.83	+23.51	−26.98
43 47.72	43 47.02	43 47.88	43 47.88	43 48.37	43 48.07			43 48.69	43 47.82	43 44.36	43 44.92
+40° ′ ″ 39 0.63	1.33	39 0.47	0.47	38 59.98	0.28			38 59.66	0.53	39 3.99	3.43
0.98		0.47		0.13				0.09		3.71	
+1 33 3	33 50									33 4	33 55
0.19310	0.19640									0.19310	0.19680
+116		−334		−349				−832		−2113	
.19426	.19756	.18976	.19306	.18971	.19291			.18478	.18808	.17197	.17507
−1.56	−1.58	−1.55	−1.56	−1.55	−1.56			−1.53	−1.54	−1.49	−1.50
−.21 −.41	−.11	−.17 −.37	−.06	−.13 −.10	−.08			−.13 −.02	−.22	−.15 +.16	−.21
−.26	−.25	−.27	−.24	.00	.00			+.14	+.17	+.30	+.38
−2.03	−1.94	−1.99	−1.86	−1.68	−1.64			−1.52	−1.59	−1.34	−1.33
+40 38 58.60	59.39	38 58.48	58.61	38 58.30	58.64			38 58.14	58.94	39 2.65	2.10
+10 16.07	16.00	+ 16.01	15.95	+17.85	17.79			+16.68	16.62	+16.40	16.34
− .07	−19.64	− .06	−20.54	− .06	−20.89			− .06	−23.16	− .06	−23.95
−0.48		−1.38		−1.43				−4.00		−4.79	
+10 15.52	49 14.12	+ 14.57	13.05	+ 16.06	14.36			+ 12.62	10.76	+ 11.35	14.20
	14.91		13.18		14.70				11.56		13.65
	49 14.51		13.12		14.53				11.16		13.92
	48 55.35		53.96		55.37				52.00		54.76

1875

May 22		May 23		May 26		May 29		June 8		June 14	
-.425		-500		-552		-488		-485		-440	
7 46.7	7 37.2	7 46.4	7 43.4	7 46.1	7 33.0	7 46.2	7 35.6	7 47.0	7 31.3	7 47.2	7 35.3
49.5	39.4	49.1	45.6	48.8	35.4	48.8	38.2	49.7	33.3	50.0	37.7
52.2	41.4	51.9	47.8	51.5	37.4	51.6	40.5	52.3	35.9	52.7	40.6
54.6		57.3		56.9		57.0		54.8		58.1	
8 0.3		8 6.0		59.6		59.7		8 0.6		8 1.0	
3.1		2.7		8 2.3		8 2.2		3.3		3.7	
5.8	8 17.2	5.5	8 21.7	5.1	7 49.2	5.0	8 27.8	6.0		6.4	8 13.2
8.6	19.0	8.4	24.4	7.9	51.8	7.7	30.5	8.8		9.1	15.5
13.9	22.1	13.7	26.7	13.2	53.7	13.2	33.1	14.2		14.6	18.4
16.8		16.4		15.9		15.9		16.9		17.4	
19.4		19.0		18.7		18.8		19.6		20.0	
2739		2704		3260		3261		2762		2802	
240		240		300		300		240		240	
339	7 39.33	304	7 45.60	260	7 35.27	261	7 38.10	362	7 33.50	402	7 37.87
8 3.082	8 19.43	8 2.764	8 24.27	8 2.364	7 51.57	8 2.373	8 30.47	8 3.291		8 3.655	8 15.70
3.062		2.744		2.344		2.353		3.271		3.635	
+ 2.46		+ 2.82		+ 3.23		+ 3.11		+ 2.12		+ 1.41	
− .36		− .43		− .47		− .42		− .42		− .38	
− 2.46		− 2.45		− 2.4x2		− 2.38		− 2.25		− 2.17	
− 0.36		− 0.06		+ 0.34		+ 0.31		− 0.55		− 0.84	
8 3.06		8 2.74		8 2.34		8 2.35		8 3.27		8 3.63	
8 2.70		8 2.68		8 2.68		8 2.66		8 2.72		8 2.79	
										2.705	
15 +23.75	−16.35	15 +17.16	−21.51	15 +27.09	+10.79	15 +24.27	−28.10	15 +29.79		15 +25.78	−12.05
1 −2.17		−2.13		−2.09		−2.06		−1.96		−1.91	
2 14.5	2 56.0	2 19.1	2 59.1	2 8.1	2 26.0	2 10.4	3 3.9	2 3.1	2 56.0	2 6.1	
35.8	15.9	41.9	20.9	34.9	49.9	33.2	26.0	25.9	18.9	28.5	
50.3	131.9	61.0	140.0	43.0	75.9	43.6	29.9	29.0	134.9	34.6	
17 25.15	18 5.95	17 30.50	18 10.00	17 21.50	17 37.95	17 21.80	18 14.95	17 14.50	18 7.45	17 17.30	
1.37566	1.21352m	1.23452	1.33264n	1.43281	1.03302	1.38507	1.44871n	1.47407		1.41128	1.08099n
1.38016	1.21802n	1.23902	1.33714n	1.43731	1.03752	1.38957	1.45321n	1.47857		1.41578	1.08549n
+24.00	−16.52	+17.34	−21.73	+27.37	+10.90	+24.52	−28.39	+30.10		+26.05	12.18
17 49.15	17 49.43	17 47.84	17 48.27	17 48.87	17 48.85	17 46.32	17 45.56	17 44.60		17 43.35	
4 59.20	58.92	5 0.51	0.08	4 59.48	59.50	5 2.03	2.79	5 3.75		5 5.00	
59.06		0.29		59.49		2.41					
33 37	34 18					33 34	34 27				
0.19540	0.19870					0.19540	0.19910				
−1105		−520		−929		−225		−341		−786	
.18435	.18765	.19020	.19350	.18611	.18941	.19315	.19685	.19199	.19569	.18754	.19124
−1.53	−1.54	−1.55	−1.56	−1.53	−1.55	−1.56	−1.57	−1.56	−1.57	−1.54	−1.55
−.14 −.35	−.07	−.08 −.35	−.12	−.20 −.34	−.03	−.16 −.58	−.21	−.23 −.54		−.19 −.51	−.04
−.22	−.28	−.22	−.29	−.22	−.23	−.34	−.45	−.31	−.43	−.32	
−1.89	−1.89	−1.85	−1.97	−1.95	−1.81	−2.06	−2.23	−2.10		−2.05	
4 57.31	57.03	4 58.66	58.11	3 57.53	57.69	4 59.97	0.56	5 1.65		5 2.95	
−16 5.61	5.67	− 5.14	5.20	− 3.47	3.53	− 5.28	5.34	− 5.73	5.79	− 7.28	7.34
− .06		− .06		− .06		− .06		− .06		− .06	
+1.36		+1.18		+0.64	÷	+0.14		−1.36		−2.10	
−16 4.31	48 53.00	− 4.02	54.64	− 2.89	54.64	− 5.20	54.77	− 7.15		− 9.44	
+1.36	52.72	+1.18	54.09		54.80		55.36				
	48 52.86		54.36		54.72		55.06		54.50		~~52.61~~ 53.51

Polaris S.P. 1874 .

N.A.
α 1h 12m 39s.372
$\frac{d\alpha}{dt}$ +20.718
δ ~~+88~~ 38' 14''.76 = 21 45.24
$\frac{d\delta}{dt}$ +19.05
δ Jan 15 1874 88° 38' 3''
l = 91 21 57
z = −48 58
sin z = −.75

N.A.
corr. α −0.16
corr. δ +0.3''
tang δ 41.95

1875
h m s
α 1 13 0.165
20.868
δ 88 38 33.81 21 26.19
19.04
δ Jan 15 ~~88~~ 38 25

	1874	1875
l sin δ	9.99988	9.99988
l cos δ	8.37723	8.37529
	.10992	.12552
	8.48715n	8.50081n
	8.48323n	
I	86425	86.814

K = + .81.643
tg δ −42.14

8.37711
6.73672
5.11383

X 1874 −18 −.08 May 19 .265 · X −.28 May 24 ~~.265~~ −2.72 · X −.28 May 26 −.280 · June 9 · X −.45 June 10 −.405 · X −.38 June 15 −.317

13 8 45.5 8 38.8 | 8 47.1 9 49.0 | 8 48.3 8 22.9 | 8 45.7 10 29.8 | 8 57.8 8 41.8
8 28.7 8 56.8 | 8 30.3 10 57.1 | 8 31.5 25.4 | 9 28.9 | 9 42.4 12 18.3
9 14.9 | 9 13.5 12 17.3 | 9 14.6 27.9 | 10 11.4 | 10 24.3
9 58.9 11 56.8 | 9 57.4 | 9 58.6 | 10 58.7 | 11 8.1
10 38.0 12 11.4 | 10 41.3 | 10 43.7 | 11 43.9 | 11 51.8
11 22.1 12 16.2 | 11 25.7 | 11 25.6 | 12 21.5 | 12 33.0
12 8.3 | 12 10.1 13 12.9 | 12 9.9 10 31.2 | 13 6.0 12 33.4 | 13 16.8 13 38.5
12 50.9 | 12 53.3 17.6 | 12 54.1 11 58.4 | 13 49.9 36.5 | 14 8.3 14 56.2
13 35.3 | 13 36.4 23.0 | 13 34.6 12 57.8 | 14 31.9 40.1 | 14 41.5

3036 | 3151 | 3209 | 2979 | 2760
160 | 60 | 60 | 120 | 180
363.6 8 47.80 | 3751 11 1.13 | 3809 8 25.40 | 417.9 10 ~~29.80~~ | 456.0 ~~10~~ ~~30.05~~
10 40.400 12 8.13 | 10 41.667 13 17.83 | 10 42.322 11 49.13 | 11 46.433 12 36.67 | 11 50.667 14 17.35
41.04 | 42.31 | 42.96 | 47.08 | 51.31
11 42.68 | 11 45.69 | 11 47.11 | 11 51.11 | 12 3.78
−61.64 +48.18 | −63.38 +50.56 | −64.15 +51.36 | −12.03 −3.46 | −12.47 −2.50
−61.48 +7.55 | −63.22 +11.75 | −63.99 +11.75 | −11.87 +18.88 | −12.21 +15.94
+3.36

+ 48.12 + 56.69 | + 50.56 + 53.68 | + 51.36 + 52.26 | − 3.50 + 40.26 | − 2.58 + 35.59
+ 11.17 12m ~~55.78~~ | + 11.46 ~~55.99~~ | + 11.80 ~~55.87~~ | + 17.07 ~~8.38~~ | + 13.36 40.34
+ 56.69 ~~17.08~~ 36.82 | + 53.68 ~~143.98~~ 38.30 | + 52.26 ~~129.18~~ 38.33 | + 40.26 ~~29.18~~ 42.76 | + 35.59 ~~56.308~~
+ 115.98 77.483 | + 115.70 74.473 | + 125.42 73.053 ~~.57~~ | + 53.83 61.053 | + 46.37 56.383
10 41.04 | 10 42.31 | 10 42.96 | 11 47.08 | 11 51.31

11 36.38 | 37.72 | 35.19 | 36.51 | 35.78
12 37.02 +10 16.17 | 12 38.01 +10 16.26 | 12 38.38 +10 17.66 | 12 40.91 +10 17.28 | 12 37.68 +10 17.67
~~57.738~~ + 1.6 | ~~58.728~~ + 1.7 | ~~59.098~~ + 1.6 | ~~1.628~~ + 1.6 | ~~58.348~~ + 1.5
57.813 − 8.20 | 58.803 − 9.00 | 59.173 − 9.40 | 61.703 − 11.20 | 58.473 − 11.40
+91 21 45.95 | 21 46.68 | 21 45.05 | 21 44.19 | 21 43.55

+112.60 −87.13 | −19.46 −156.16 | + ~~76.92~~ 136.92 −66.81 | + 76.63 −50.24 | + 98.65 −146.68
10 | 10 | 10 10 | 10 | 10

−2.20 | −2.19 | −2.18 | −2.04 | −1.98

2 23.9 2 16.7 | 2 16.2 2 12.0 | 2 23.8 2 16.5 | 2 16.1 2 9.8 | 2 18.5 2 13.7 | 2 21.0 2 10.5
19.9 13.9 | 15.0 10.9 | 23.9 16.1 | 29.9 20.2 | 22.6 16.9 | 25.2 14.7
43.8 30.6 | 31.2 22.9 | 47.7 32.6 | 46.0 30.0 | 41.1 30.6 | 46.2 25.2
12 21.90'' 12 15.30 | 12 15.60 12 11.45 | 12 23.85 12 16.30 | 12 23.00 12 15.00 | 12 20.55 12 15.30 | 12 23.10 12 12.60

2.05154 1.94315m | 1.28914n 2.19360n | ~~1.88604~~ 2.13647 1.82484n | 1.88440 1.70105n | 1.99410 2.16637m
0.53869m 0.42030 | 9.77629 0.68075 | 0.~~37319~~n 62367 0.31199 | 0.36763n 0.18428 | 0.47733n 0.64960
−3.46 +2.63 | +0.60 +4.79 | − ~~2.36~~ 4.23 +2.05 | −2.33 +1.53 | −3.00 +4.46
12 18.44 17.93 | 12 16.20 16.24 | 12 ~~21.49~~ 19.62 18.35 | 12 18.22 16.83 | 12 20.10? 17.06?

10 29.91 30.42 | 10 32.15 32.11 | 10 28.72 30.00 | 10 30.13 31.52 | 10 28.25 31.29
30.16 | 32.13 | 29.36 | 29.77

−48 57 55 58 2
1.82000n 1.82000
+133 | −311 | −331 | −810 | −1303

1.82133 1.82133 | 1.81685 1.81689 | 1.81669 1.81669 | 1.81190 1.81190 | 1.80697 1.80697
+66.27 +66.27 | +65.60 +65.56 | +65.57 +65.57 | +64.85 +64.85 | +64.12 +64.12

+10 −.05 +10 | +.2 .004 +33 | + .24 +.13 +26 | +.13 ~~+.07~~ +.05 +.14 | +.29 +.44 +.17
−.19 −.20 18 | −.21 18 −.20 18 | .00 .00 | +.09 +.09 | +.22 +.20
+1 6.25 +1 6.19 | +1 5.44 +1 ~~4.25~~ 5.81 | 5.83 5.83 | +1 5.07 +1 4.99 | +1 4.63 +1 4.49
11 36.16 36.61 | 11 37.57 ~~36.36~~ 37.86 | 34.55 35.88 | 11 35.20 36.51 | 33.88 35.78
38 6.0 | 5.8 | 5.4 | 36 | 3.4
21 53.4 | 54.2 | 54.6 | 56.4 | 56.6
+10 17.2 16.8 | 16.6 17.8 | 20.1 18.8 | 21.2 19.9 | 23.7 20.8
+12 ~~17.0~~ 16.9 ~~17~~ 16.5 | ~~16.9~~ 16.3 ~~18.1~~ 17.5 | ~~20.4~~ 19.5 ~~19.1~~ 18.5 | ~~21.5~~ 20.9 ~~21.2~~ 19.6 | 23.4 40.54 ~~21.1~~ 20.5
+11 ~~17.3~~ ~~2.1~~ 45.68 | ~~17.4~~ 46.24 | ~~19.7~~ 44.63 | ~~21.3~~ 19.3 | 43.44 ~~21.1~~
17.0 16.7 46.13 | ~~17.1~~ 16.9 17.65 65 | 19.4 19.1 45.91 | ~~21.0~~ 20.2 | +17.58 17.06 −20.44 ~~30.5~~ 20.5
−3 10 +10 16.07 17.72 −27.24 | + 16.01 −28.04 46.37 | + 17.85 19.48 −28.44 | + 16.68 18.21 −30.24 43.52 | + 14.8 41.99
+ 16.5 21 45.90 26.85 | 16.4 ~~45.6~~ 27.33 | 16.3 45.27 26.22 | 15.3 24.47 | ~~11.40~~ ~~42.4~~ 42.45
− 8.20

N.A. $\frac{dx}{dt}$ $\frac{dy}{dt}$
1874 +20.718 +19.05
1875 20.868 19.04
20.793 +19.04

1875 N.A.
corr −0.20

1874 1875
long δ −41.95 −42.14

X −.38 June 17 −.410
X −.37 22 June ~~18~~ −.367
X 1874 −.40 June 25 −.403
1875 −.43 May 22 −.425
−.49 May 23 −.500
−.55 May 26 −.552

9 ~~58.7~~ 9 46.5 | 12 45.5 13 8 2 | 12 46.3 12 59.8 | 8 49.8 8 58.4 | ~~8~~ 45.9 9 2.5 | 8 43.1 8 33.8
9 41.4 | 13 25.7 42.1 | 13 28.7 26 | 9 32.0 | 9 29.1 | 9 26.4
10 26.2 | 14 9.0 58.4 | 14 11.0 1.9 | 10 14.2 | 10 12.2 | 10 9.8
11 9.4 | 55.0 5.88 | 14 56.0 0.8 | 10 59.8 | 10 55.4 | 10 55.7
11 53.2 | 61.4 | 2.4 | 11 40.4 | 11 37.5 12 34.2 | 11 39.5 11 14.5
12 36.7 | last 4 wires | last 4 wires | 12 25.8 | 12 20.5 | 12 21.9
13 18.6 13 0.2 | 13 8.2 12 6.6 | 13 2.7 | 13 3.0
14 2.2 | 13 51.7 | 13 51.1 | 13 45.2
14 46.3 | 14 34.5 | 14 32.7 | 14 28.4

2924 | 3164 | 2871 | 2730
180 | 60 | 60 | 60
4724 9 46.50 | 3764 8 58.40 | 347.1 9 2.50 | 333.0 8 33.80
11 52.489 13 0.20 | 12 0.300 13 8.20 | 12 19.25 12 59.80 | 11 41.822 12 6.60 | 11 38.567 12 34.20 | 11 37.000 11 14.50
53.13 | 0.94 | 2.57 | 42.47 | 39.21 | 37.64
12 5.43 | 12 9.50 | 12 12.45 | 12 3.83 | 12 45.2 | 12 6.43
−12.30 −3.47 | −8.56 −6.07 | −9.88 −7.17 | −21.36 +2.50 | −25.31 +2.84 | −28.79 +3.25
−12.14 +15.94 | −8.40 +15.52 | −9.92 +16.78 | −21.16 +18.12 | −25.11 +20.65 | −28.59 +23.18

− 3.37 +33.94 | − 6.07 +29.87 | − 7.17 +26.92 | + 2.46 +56.33 | + 2.82 + 55.64 | + 3.23 +53.73
+ 17.28 39.54 | + 15.46 40.26 | + 16.98 39.10 | + 17.91 12 59.42 | + 21.07 58.34 | + 23.26 57.80
+ 33.94 ~~54.658~~ | + 29.87 ~~50.588~~ | + 26.92 ~~47.638~~ | + 57.33 | + 55.64 | + 53.73
+ 47.85 54.733 | + 39.26 50.663 | + 30.73 47.713 | + 76.70 | + 79.53 | + 80.22
11 53.13 | 12 0.94 | 12 2.57 | 11 42.47 | 11 39.21 | 11 37.64
37.96 | 37.12 | 37 35.96 | 34.18 | 33.96
12 40.98 +10 16.13 | 12 40.20 +10 18.04 | 12 39.30 | 12 59.17 −16 5.57 | 12 58.74 −16 4.80 | 12 57.86 −16 3.35
~~16.98~~ + 1.6 | ~~0.818~~ + 1.5 | ~~0.018~~ | + 1.7 | + 1.6 | + 1.7
61.773 − 11.50 | 60.993 − 11.80 | 60.093 | − 3.70 | − 3.90 | − 4.50
21 44.19 | 21 44.86 | 21 28.39 | 21 27.08 | 21 27.81

+ 125.99 − 127.71 | − 67.90 | − 57.88 | + 163.42 − 24.78 | + 156.07 − 55.63 | + 183.20 + 22.50
10 | 10 | 10 | 45 | 45 | 45
−1.93 | −1.84 | | −2.17 | −2.13 | −2.09
2 16.1 2 9.1 | 2 10.4 | 2 11.3 | 1 9.3 1 3.0 | 1 12.1 1 4.9 | 1 11.7 1 5.1
18.5 11.1 | 14.8 | 15.9 | 35.7 28.5 | 38.0 29.4 | 39.9 33.1
.346 202 | 252 | 272 | 450 315 | 501 343 | 516 382
12 17.30 12 10.10 | 12 12.60 | 12 13.60 | 46 22.50 46 15.75 | 46 25.05 46 17.15 | 46 25.80 46 19.10

2.10034 2.10622n | 1.83187n | 1.76253n | 2.21326 1.39410n | 2.19332 1.74531n | 2.26293 1.35218
0.58357n 0.58945 | 0.31510 | 0.24576 | 0.71407n 9.89491 | 0.69413n 0.24612 | 0.76374n 9.85299n
−3.83 +3.89 | +2.07 | +1.76 | −5.18 +0.78 | −4.94 +1.76 | −5.80 −0.71
12 13.47 13.99 | 12 14.67 | 12 15.36 | 46 17.32 16.53 | 46 20.11 18.91 | 46 20.00 18.39

10 ~~34.88~~ 34.62 34.36 | 10 33.68 | 10 32.99 | 36 31.03 31.42 31.82 | 36 28.24 28.84 29.44 | 36 28.35 29.15 29.96

58 0 58 7 | 57 26 57 32
1.82000n 1.82000n | 1.81980n 1.81990n
−2113 | −2127 | −1070 | −502 | −904
1.79887 1.79887 | 1.79873 1.79873 | 1.80910 1.80920 | 1.81478 1.81488 | 1.81086 1.81096
+62.93 +62.93 | +62.91 +62.91 | +64.43 +64.45 | +65.28 +65.29 | +64.69 +64.71

+ 21 +.41 + 21 | + 05 ~~+.26~~ +.53 | + 04 +.26 | + 35 +.09 + ~~08~~ | + 32 +.05 + 04 | + 44 +.10 + .01
+.21 +.20 | +.48 | +.48 | −.13 −.12 | −.13 −.12 | −.13 −.12
+1 3.35 +1 3.34 | +1 3.44 | | +1 4.65 +1 4.41 | +1 5.47 +1 5.21 | +1 5.00 +1 4.60
38.23 37.70 | 37.12 | | 37 35.68 36.22 | 33.71 34.65 | 33.35 34.56
33 | 3.0 | 3.0 | 39 3.01 | 2.9 | 2.93
5.67 | 5.70 | 5.70 | 2.9 | 3.01 | 3.7
18.5 19.0 | 19.9 | | −16 5.8 (6.0) 6.3 | 3.6 (4.0) 4.5 | 2.7 (3.3) 3.9
~~18.8~~ 18.2 ~~19.3~~ 18.7 | ~~20.2~~ 15.6 | | −16 ~~5.8~~ 6.1 6.6 | 3.8 4.8 | ~~3.0~~ 4.2
~~19.0~~ 18.4 44.57 | ~~20.7~~ 19.6 | | ~~5.7~~ 6.3 27.99 | ~~3.7~~ 4.5 26.26 | ~~3.0~~ 3.6 26.94
~~18.7~~ 17.84 44.04 | ~~19.9~~ 18.94 | | ~~6.6~~ 3.99 28.54 | ~~4.6~~ −3.55 27.20 | ~~3.3~~ −1.91 28.15
+ 16.40 −30.54 | + 17.56 −30.84 | | −16 5.61 | − 5.14 | − 3.47
+ 1.44 44.30 25.25 | 1.38 44.26 | 25.21 | + 1.62 28.26 | + 1.59 26.73 | + 1.56 27.54
| | | − 3.70 | − 3.90 | − 4.50

1874.0 α	δ	1875.0 α	δ
37.02		59.17	
38.01		58.74	
38.38		57.86	
40.91		58.43	
37.68		58.99	
40.98		60.82	
40.20		59.38	
39.30			
39.060		59.056	
38.678	15.10	.433	34.16
+.382		−.377	

−.52 May 27 May 29 −.50 June 8 −.45 June 10 −.45 June 14

−.510 −.485 −.442 −.440

10 10 33.8 Clh. f. 8 8 35.7 9 7 14.8 9 8 35.4
— 58.9 3.7 9.5
— 9 40.8 47.5 48.6
10 26.6 10 30.4 10 34.0
55.7 11 8.7 12 37.2 11 13.1 11 17.5
11 36.7 12 45.7 11 52.9 59.6 12 13.2 12 0.2
12 25.9 39.1 12 35.7 12 40.7 42.7 13 33.5
13 6.9 36.7 13 19.7 13 25.8 13 27.1
51.4 42.5 14 4.2 14 8.1 14 8.1
40.1
14 33.5 41.2 14 45.3 52.0 54.0
39.9

11 39.917 10 33.80 8 35.70 7 14.80 8 35.40
11 39.917 12 45.70 11 52.533 12 37.20 11 57.878 12 13.20 12 0.189 13 33.50
40.56 53.18 58.52 0.83
12 7.07 12 16.91 12 18.39 12 21.86
− 26.51 + 3.29 −23.73 + 2.13 −19.87 + 1.89 − 21.03 + 1.68
−26.31 + 21.91 −23.53 + 21.07 − 19.67 + 18.96 − 20.83 + 18.96

+ 3.29 + 53.09 + 2.12 + 43.25 + 1.91 + 41.77 + 1.41 + 38.30
+ 21.49 +2 58.85 + 20.44 59.63 + 18.62 13m 1.14 + 18.54 12m 59.77
+ 53.09 + 43.25 + 41.77 13m ~~1.15~~ + 38.30 12m
+ 77.87 + 65.81 + 62.30 + 58.55
11 40.56 11 53.18 11 58.52 12 0.83
37 32.48 37.01 38.53 39.07
12 58.43 −16 3.59 12 58.99 −16 5.59 13 0.82 −16 7.14 12 59.38 −16 7.14
+ 1.6 + 1.7 + 1.8 + 1.7
− 4.70 − 6.10 − 6.40 − 6.60
21 25.79 21 27.02 21 26.79 21 27.03

+ 66.12 − 65.78 + 196.83 − 44.67 + 283.08 − 15.32 + 204.79 − 93.31
45 45 45 45 45

+2.07 −1.96 −1.94 −1.91
1 9.1 1 5.2 1 12.5 1 6.0 1 10. 1 2.6 1 12.6 1 2.0 1 7.1 0 58.5
37.1 33.0 37.3 30.1 36. 28.5 37.5 25.0 34.8 24.0
46.2 38.2 49.8 36.1 4.9 31.1 50.1 27.0 41.9 142.5
46 23.10 46 19.10 46 24.90 46 18.05 46 23.45 46 15.55 46 25.05 46 13.50 46 20.95 46 11.25

1.82033 1.81809_n 2.29404 1.65002_n 2.44721 1.18526_n 2.31116 1.96993_n
0.32114_n 0.31896 0.79485_n 0.15083 0.94802_n 9.68607 0.81197_n 0.47074.
− 2.09 + 2.08 − 6.23 + 1.41 − 8.87 + 0.48 − 6.49 + 2.96
46 21.01 21.18 46 17.22 16.96 46 16.18 13.98 46 14.46 14.21

36 27.34 27.17 36 31.13 31.39 36 31.17 34.37 36 33.89 34.14
27.25 31.26 32.77 34.01
57 27 57 37
0.81990_n 0.81990_n
−505 −321 −413 −763
1.81475 1.81485 1.81659 1.81669 1.81567 1.81577 1.81227 1.81227
+65.28 +65.29 +65.55 +65.57 +65.41 +65.43 +64.90 +64.91

+.06 −.06 +.06 +.50 +.18 +.26 +1.07 +.34 +.08 +.54 +.15 +.11
−.13 −.12 −.20 −.18 −.20 −.17 −.18 −.17
+1 5.21 +1 5.23 +1 5.85 +1 5.65 +1 6.23 +1 5.29 +1 5.26 +1 4.85
37 32.53 32.40 36.98 37.04 37.40 39.66 39.15 38.99
2.91 2.77 2.74 2.72
3.09 32.3 32.6 32.8
−16 1.7 1.6 1.5 47 4.7 47 48 5.9 7.1 6.3 6.2 6.2
−16 1.6 −16 7.16 47 −10.36 60 − 12.29 6.2 − 12.45
−16 1.39 21 25.39 ~~44~~ 5.0 26.62 ~~57~~ 63 25.11 ~~59~~ 65 26.70
~~1.6~~ 2.46 25.24 47 4.26 26.38 ~~61~~ 5.89 27.37 ~~62~~ 5.85 26.54
−16 4.01 − 5.73 − 7.34 − 7.28
+ 1.55 + 1.47 + 1.45 + 1.43
− 4.70 21 25.31 − 26.50 − 6.40 26.24 − 6.60 26.62

63 Virginis

	1874	1875	
h m sec 13 16 20	α	16 19.58	corr α =
	δ	4 48.46	corr δ =
−17° 4′	dα/dT	+3.202	
	dδ/dT	−19.00	tang δ = −.31
z = +59° 27′	l cos δ 9.98044	9.98044	I = 2.16 s
sin z = +.86	l c .10992	.12552	
	l c′ .09036	.10596	K = −.016 s
	l c′ .08644		
	l sin δ 9.46758n		

	1874 May 19		May 24		May 26		June 9	1874 June 10		1875 May 26	
	.265		~~.248~~ −272		.280			−.405		−.562	
13	15 16.7	15 16.1	15 14.2	15 6.9	15 13.6	15 12.6		16 8.1	16 6.2	16 5.1	15 59.3
	19.0	18.0	16.4	9.0	15.7	14.4		10.3		7.1	1.3
	21.0	20.5	18.5	11.3	17.7	16.4		12.3		9.3	3.3
	25.3		22.8		22.0			16.7		13.6	
	27.5		24.9		24.2			18.8		15.8	
	29.6		27.1		26.3			21.0		17.9	
	31.8	15 50.5	29.3	15 37.4	28.5	15 56.0		23.1		20.1	16 32.6
	34.0	52.9	31.4		30.6	57.9		25.4		22.2	34.0
	38.2	55.0	35.8		35.0	59.7		29.5		26.5	36.1
	40.4		37.9		37.0			31.8		28.8	
	42.5		40.1		39.2			34.0		31.0	
	3260	15 18.20	2984	15 9.07	2898	15 14.47		2310	16 6.20	1974	16 1.30
	15 29.636	15 52.80	15 27.127	15 37.40	15 26.345	15 57.87		16 21.000		16 17.945	16 34.23
	29.620		27.111		26.329			20.984		17.929	
	+ 48.12		+ 50.56		+ 51.36			− 3.50		+ 3.23	
	+ .08		+ .08		+ .08			+ .12		+ .17	
	− 1.44	+1.762	− 1.43 +1.772		− 1.42	+1.782		− 1.33	+1.872	− 1.43	
	+ 46.76		+ 49.21		+ 50.0~~0~~2			− 4.71		+ 1.67	
	15 29.62		15 27.11		15 26.33			16 20.98		16 17.93	
	16 16.38		16 16.32		16 16.3~~3~~5			16 16.27		16 19.60	
	19.582		19.522		19.5~~2~~2 5			19.472 16.325			

	+11.44	−23.16	+18.06	−10.27	+11.87	−31.53		+14.80		+16.64	−16.29
	35		35		35		35	35		5	
	1 −220		−219		−218			−204		−209	
	0 44.0	1 26.2	0 39.0	1 14.2	0 46.0	1 41.6	1 13.0	0 45.9		4 39.0	0 21.1
	56.3	37.9	53.0	28.8	59.7	58.7	59.0	1.8		59.4	42.9
	100.3	64.1	92.0	43.0	105.7	105.3	72.0	101.7		98.4	64.0
	35 50.15	36 32.05	35 46.00	36 21.50	35 52.85	36 ~~50.15~~ 49.65	36 36.00	35 53.85		9 49.20	10 32.00
	1.05729	1.36474n	1.25672	1.01157n	1.07445	1.49872n		1.17026		1.22115	1.21192n
	1.14765	1.45510n	1.34708	1.10193n	1.16481	1.58908n		1.25670		1.32711	1.31788n
	14.05	−28.52	+22.24	−12.64	+14.62	−38.82		+18.06		+21.24	−20.79
	36 4.20	36 3.53	36 8.24	36 8.86	36 7.47	36 ~~11.33~~ 8.83		36 11.91		10 10.44	10 11.21
−17°	13 15.85 15.51	15.18	13 19.89 20.20	20.51	13 19.12 19.80	13 ~~22.98~~ 20.48		23.56		47 22.09 22.47	22.86
+59	25 33	26 15			25 33	26 31				26 1	26 44
	1.98746 +146	1.98767	−295		1.98746 −318	1.98772		−794		1.98758 −891	1.98778
	1.98892	1.98913	1.98451	1.98472	1.98428	1.98454		1.97952	1.97978	1.97867	1.97887
	−97.48	−97.53	−96.50	−96.54	−96.45	−96.50		−95.39	~~−95.45~~ +	−95.21	−95.25
	0	0	−1	−1	0	0		−1	−	−1	−1
	+.02 −.04	+.08	+.05 −.05	+.02	+.02 +.08	+.14		+.03	~~+.03~~	+.04 −.19	+.04
	−.06	−.12	−.06	−.11	.00	.00		+.04	+.07	−.43	−.04
	−1 37.52	−1 37.57	−1 36.52	−1 36.64	−1 36.43	−1 36.36		−1 35.33		−1 35.61	−1 35.26
−17	14 53.37	52.75	14 56.41	57.15	14 55.55	14 56.84		14 58.89		48 57.70	58.12
	+10 16.07	14.18	+16.01	14.13	+17.85	15.98		+16.68	14.93	−16 3.47	5.26
	− 1.89	−5.43	− 1.88	−5.34	− 1.87	−5.31		− 1.75	−5.31	− 1.79	
	+13.54		+13.66		+13.69			+13.69		+16.06	
	+10 27.15	4 25.62	+ 27.79	28.62	+ 29.67	25.88		+ 28.62		−15 49.20	4 46.90
		25.00		29.36		27.17					47.32
		4 25.31		28.99		26.52		30.27	~~29.14~~		4 47.11
		4 44.31		47.99		45.52		49.27	~~48.41~~		

1875
May 29
6h f

June 8
485
16 6,1 15 57,3
8,2 59,2
10,4 1,0
14,7
16,8
18,9
21,0 16 41,6
23,2 43,1
27,6 45,9
29,7
32,0

20 8 6 15 59.17
16 18.964 16 43.53

18.948

+ 2.12
+ .15
− 1.66
+ 0.61
16 18.95

16 19.56

19.580

s
+19.79 −24.57
5 5
−1.96
′ ″
4 43.1 − — 4 32.9 0 29.0
0.9 4.5 1.0 58.9
1040 939 879
9 52.00 9 46.95 10 43.95

1.29645 1.39041
1.40241 1.49637
+ 25.26 −31.36
10 12.21 10 12.59

47 23.86 24.24
24.05
25 59 26 56
1.98758 1.98784
−306
1.98452 1.98478
−96.50 −96.56
− 1 − 1
+ .05 −.31 + .09
−.67 −.10
− 1 37.13 − 1 36.58
49 0.99 0.82
−16 5.73 7.41
1.68
−
+16.08
−15 51.33 52.32
52.15

52.23

N. A. 3

α Virginis

h m sec.
13 18 37
− 10° 30′

z = + 52° 53′
δ sin z = +.80

1874
α 18 33.448
δ 30 9.69
dα/dT + 3.153
dδ/dT − 18.91

log cos δ 9.99267
log b .10992
log b′ .10259

log b′ .09867

log sin δ 9.26063n

1875
~~18 36.54~~ 18 36.602
~~30 29.75~~ 30 28.60
~~+ 3.152~~ + 3.153
~~− 18.89~~ − 18.90

9.99267
.12652
.11819

corr α =
corr δ =

long δ = −.19 1.02

I = 2.09 s

k = −.016 s

1874

		m s			
May	10	18 34.93	30	22.0	
	15	34.92	−.01	22.0	0
	20	34.91	.01	21.9	1
	25	34.90	1	21.9	0
	30	34.88	2	21.8	1
June	4	34.86	2	21.7	1
	9	34.83	3	21.5	2
	14	34.79	4	21.4	1
	19	34.75	4	21.2	2
	24	34.71	4	21.0	2
	29	34.67	4	20.7	3

1874

May 19 −.18 −.265	−.08	May 24 −.28 ~~−.268~~ −2.72		May 26 −.28 ~~−.280~~		June 9	June 10 −.45 −.405		June 22 −.37 −.367	
13 17 34.4	17 33.0	17 31.7	17 21.8	17 31.0	17 22.8		18 25.5	18 14.7	18 28.1	18 22.0
36.4	35.3	33.7	23.9	33.0	25.0		27.7	17.1	30.3	24.2
38.6	37.5	35.8	25.7	35.1	26.9		29.8	19.0	32.3	26.0
42.6		40.1		39.3			34.1		36.5	
44.7		42.2		41.4			36.2		38.6	
46.8		44.4		43.5			38.2		40.8	
48.9	18 21.9	46.4	17 58.5	45.6	17 55.5		40.3	18 54.3	42.9	18 56.4
51.0	23.4	48.6	0.5	47.7	57.4		42.4	53.8	44.9	58.8
53.1	24.6	52.6	2.1	52.0	59.0		46.6	58.0	49.2	.06
57.3		54.7		54.2			48.9		51.2	
59.2		56.9		56.2			51.0		53.3	
5150	17 35.27	4871	17 23.80	4790	17 24.90		4207	18 16.93	4481	18 24.07
17 46.818	18 23.30	17 44.282	18 0.37	17 43.545	17 51.30		18 38.245	18 56.03	18 40.736	18 58.60
46.802		44.266		43.529			38.229		40.720	
	+48.18		+50.56		+51.36			−3.47		−~~+~~6.07
+ 48.13	+.03	+ 50.57	+.05	+ 51.36	+.05		− 3.50	+.09	− 6.08	+.07
+ .05	−.08	+ .05		+ .05			+ .08		+ .07	
− 1.46	+1.692 −1.46	− 1.41	+1.702 −1.45	− 1.44	+1.712 −1.44		− 1.37	+1.782 −1.37	− 1.28	+1.872 −1.28
+ 46.72	18 33.47	+ 49.17	33.43	+ 49.97	33.50		− 4.79	33.48	− 7.29	33.44
46.80		44.27		43.53			38.23		40.72	
18 33.52		33.44		33.50			33.44		33.42	
36.672		36.592		36.652			36.592		36.582	
	40 35.69		37.75		38.30			37.73		39.24
	+10 16.17		+10 16.26		+10 17.66			+10 17.28		+10 18.04
	−1.7		−1.7		−1.7			−1.6		−1.5
	+12.20		+12.20		+12.20			+ 11.80		+ 11.40
	−10 30 9.02		30 10.99		30 10.14			30 10.25		30 11.30
+11.55	−36.48	+20.48	−16.09	+18.64	−13.76		+21.31	−17.79	+16.67	−17.86
0		0		0		0	0		0	
−2.00		−2.19		−2.18			−2.04		−1.84	
1 46.7	2 47.5	1 37.7	2 23.0	1 41.0	2 21.3	1 40.2	1 37.5	2 24.8	1 45.9	2 29.0
59.9	0.0	52.0	38.4	54.7	35.9	6.7	54.1	41.4	4.1	47.2
1066	1075	897	614	957	572	1067	916	662	1100	762
1 53.30	2 53.75	1 44.85	2 30.70	1 47.85	2 28.65	1 53.35	1 45.80	2 33.10	1 55.00	2 38.10
1.06258	1.56205n	1.31133	1.20656n	1.27045	1.13862n		1.32858	1.25018n	1.22194	1.26188n
1.16517	1.66464n	1.41392	1.30915n	1.37304	1.24121n		1.42725	1.34885n	1.32061	1.35055n
+14.63	−46.20	+25.94	−20.38	+23.61	−17.43		+26.75	−22.33	+20.93	−22.42
2 7.93	2 7.55	2 10.79	2 10.32	2 11.46	2 11.17		12.55	2 10.77	2 15.93	2 15.68
−10° 39 19.58	19.20	39 22.44	21.97	39 23.11	22.82		39 24.20	22.42	39 27.58	27.33
19.39		22.20		22.96			23.31		27.45	
+52 51 36	52 37								51 38	52 21
1.88010	1.88040								1.88010	1.88030
+154		−284		−309			−783		−2105	
1.88164	1.88194	1.87726	1.87756	1.87701	1.87731		1.87227	1.87257	1.85905	1.85925
−76.15	−76.20	−75.38	−75.43	−75.34	−75.39		−74.52	−74.57	−72.29	−72.32
0	0	0	0	0	0		0	0	− 1	− 1
+.01	−.12 +.12	+.04	−.14 +.02	+.03	+.02 +.02		+.05	+.12 +.03	+.03	+.52 +.03
−.15	−.23	−.14	−.20	.00	.00		+.07	+.10	+.42	+.57
− 1 16.29	− 1 16.31	− 1 15.48	− 1 15.61	− 1 15.31	− 1 15.37		− 1 14.40	− 1 14.44	− 1 11.85	− 1 11.78
−10 40 35.87	35.51	40 37.92	37.58	40 38.42	38.19		40 38.60	36.86	40 39.43	39.06
+10 16.07	14.31	+ 16.01	14.26	+17.85	16.11		+ 16.68	15.05	+ 17.56	16.09
− 1.76	−6.70	− 1.75	−6.70	− 1.74	−6.70		− 1.63	−7.10	− 1.47	−7.50
+ 12.20		+ 12.20		+ 12.20			+ 11.80		+ 11.40	
+10 26.51		+ 26.46		+ 28.31			+ 26.85		+ 27.49	
30 9.36	9.00	30 11.46	11.12	10.11	9.88		11.75	10.01	11.94	11.57
30 9.18		30 11.29		10.00			10.88		11.75	
30 28.09		30.20		28.91			29.79		30.65	

1875

		m s		′ ″	
May	19	18 38.58		30 43.2	
	24	38.37	−.01	43.2	−.0
	29	38.35	.02	43.1	.1
June	3	38.33	.02	43.0	.1
	8	38.30	.03	42.8	.2
	13	38.27	.03	42.7	.1
	18	38.23	.04	42.5	.2

1874		1875									
−40 June 25 −403		−49 May 23 −500		−55 May 26 −552		7.50 June 8 +485		7.45 June 10 −442		7.45 June 14 −440	
18 —	18 53.4	18 23.0	18 15.4	18 22.4	18 15.9	18 23.4	18 11.3	18 23.8	18 14.0	18 23.9	18 17.1
—	56.9	25.0	17.7	24.4	17.5	25.6	13.1	25.8	16.0	26.0	18.9
—	58.2	27.1	19.8	26.7	20.0	27.8	15.0	28.0	17.8	28.1	20.5
37.4		31.2		30.9		31.9		32.2		32.3	
39.6		33.4		33.0		34.0		34.3		34.4	
41.7		35.5		35.1		36.1		36.3		36.4	
43.8		37.6	18 56.0	37.1	19 7.4	38.2	18 54.2	38.4	19 1.7	38.5	18 48.5
46.0		39.8	58.4	39.4	9.5	40.3	56.2	40.6	3.2	40.7	53.5
—		43.9	00	43.4	11.4	44.5	58.2	44.8	5.9	44.8	53.1
—		46.0		45.5		46.6		46.8		47.0	
—		48.0		47.7		48.8		49.0		49.1	
20.85	18 56.83	39.05	18 17.63	38.56	18 17.80	39.72	18 13.13	40.00	18 15.93	40.12	18 18.83
18 41.700		18 35.500	18 58.13	18 35.055	19 9.43	18 36.109	18 36.20	18 36.364	19 3.60	18 36.473	18 50.70
41.684		35.484		35.039		36.093		36.348		36.457	
− 7.18 + .08	−7.18 +.08	+ 2.82 + .09	+2.84 +09	+ 3.23 + .10	+3.25 +.10	+ 2.12 + .09	+2.13 +.10	+ 1.91 + .08	+1.89 +09	+ 1.41 + .08	+1.68 +.09
− 1.25 − 8.35 41.68 33.33	+1.902 −1.25 3333 36482	−1.76 +1.15 35.48 36.63	−1.76 3665	−1.76 +1.57 35.04 36.61	−1.76 36~~43~~ .63 .63	−1.76 +0.51 36.09 36.60	−1.70 36~~42~~ 62 62	−1.69 +0.30 36.35 36.65	−169 3664	−1.65 + 0.14 36.~~4~~56 36.~~58~~ 60	−1.65 3658
33.443	−1.5		14 3800 −16 480 −1.8 +1460 30 3000		3849 −16 335 −1.8 +1450 30 2914		3701 −16 559 −1.8 +1420 30 3020		3677 −16 714 −1.8 +1410 30 3161	36.616	3594 −16 714 −1.9 +1410 30 3088
0 −15.13		35 +17.87 −2.13	−22.63	35 +17.25 −2.09	−34.38	35 +22.98 −1.96	−20.09	35 +20.43 −1.94	−27.24	35 +17.64 −1.91	−14.23
2 24.7 44.5 69.2″ 2′ 34.60″		0 38.0 57.1 95.1 35 47.55	1 32.0 50.2 82.2 36 41.10	0 39.9 59.5 99.4 35 49.70	1 47.1 8.0 115.1 36 57.55	0 29.5 49.5 79.0 35 39.50	1 27.0 45.8 72.8 36 36.40	0 34.7 51.9 86.6 35 43.30	1 37.0 53.5 90.5 36 45.25	0 36.8 55.6 92.4 35 46.20	1 18.9 37.8 56.7 36 28.35
1.17984n 1.27851n −18.99 2 15.81		1.25212 1.37031 +23.46 36 11.01	1.35468n 1.47287n −29.71 36 11.39	1.23679 1.35498 +22.64 36 12.34	1.53631n 1.65450n −45.13 36 12.42	1.36135 1.47954 +30.17 36 9.67	1.30298n 1.42117n −26.37 36 10.03	1.31027 1.42846 +26.82 36 10.12	1.43521n 1.55340n −35.76 36 9.49	1.24650 1.36469 +23.16 35 9.36	1.15320n 1.27139n −18.68 36 9.67
39 27.26		13 22.66 22.85	23.04	13 23.99 24.03	24.07	13 21.32 21.50	21.68	13 21.77 21.45	21.14	13 21.01 21.16	21.32
		51 59 1.88020	52 53 1.88050							51 58 1.88020	52 40 1.88040
+.02 +.57		−479 1.87541 −75.06 0 +.03 −.07	1.87571 −75.11 0 −.07 +.05 −.15	−871 1.87149 −74.39 − 1 +.03 −.07	1.87179 −74.44 − 1 −.04 +.13 −.17	−295 1.87725 −75.38 0 +.06 −.10	1.87755 −75.43 0 −.11 +.04 −.22	−413 1.87607 −75.18 0 +.04 −.10	1.87637 −75.23 0 −.11 +.07 −.24	−733 1.87287 −74.62 0 +.03 −.11	1.87307 −74.66 0 −.13 +.02 −.21
		−1 15.10 14 37.76 −16 5.14 − 1.70 + 14.60 −15 52.24 30 30.00	−1 15.21 38.25 6.84 30.49	−1 14.44 14 38.43 − 3.47 − 1.67 + 14.50 −15 50.64 29.07	−1 14.49 38.56 5.14 29.20	−1 15.42 14 36.74 − 5.73 − 1.57 + 14.20 − 53.10 29.84	−1 15.61 37.29 7.30 30.39	−1 15.24 14 37.01 − 7.34 − 1.55 + 14.10 − 54.79 31.80	−1 15.40 36.54 8.89 31.33	−1 14.70 14 35.71 − 7.28 − 1.53 + 14.10 − 54.71 30.42	−1 14.85 36.17 8.81 30.88
		30 30.24		29.13		30.12		~~31.62~~ 31.56		30.65	

3

ζ Ursae Majoris pr.

α 13h 18m 54 sec.

δ +55° 35′

θ = − 13° 12′

θ in z = −.23

cos α =

cos δ =

tang δ = +1.46

I = 3.64s

k = −.027s

1874					
June	9	18m	53.43s	34′	67.4″
	14		53.31 −.12		67.8 +4
	19		53.19 .12		68.3 .5
	24		53.07 .12		68.8 .5
	29		52.94 .13		69.3 .5

1874

α 50.967s

δ +35′ 0.81″

$\frac{d\alpha}{d\tau}$ +2.432s

$\frac{d\delta}{d\tau}$ −18.933″

l cos δ 9.75221

l C .10600

l C′ 9.85831

l sin δ 9.91643

1874.0

α	δ
50.93	
~~51.80~~	
51.07	
51.000	
50.967	0.81
+.033	

× 1874 −38 June 15 18 −.317

× −38 June 17 −.410

34.5	35.3	19	23.0 27.1	18	35.5	18	34.1
38.1	38.9		30.0		38.5		
41.7	42.6				42.6		
49.0	49.9	19	40.0 43.0		49.9		
52.6	53.6		46.0		55.5		
56.3	57.1				57.1		
59.9	0.8	18	8.6 12.0		0.8	19	29.1
3.5	4.5		13.6		4.5		33.5
10.9	11.7				11.8		37.2
14.6	15.5	18	24.4 27.8		16.4		
18.3	19.1		30.6		19.0		

3794 3290 3307

240 300 300

6194 6290 19 26.0 18 11.73 6307 18 34.10

56.309 57.182 19 43.00 27.60 18 57.336 19 33.27

56.282 57.155 −2.50 57.309 −3.47

53.30 28 53.30 28 −.55 18 53.28 28 −.55

+2.98 3.00 +3.857 +4.028

−2.31 −2.26

18 50.92 51.80 18m 51.03

− 2.58 − 3.38 18

− .46 − .46 − .60

− 2.31 − 2.31 +0.122 − 2.26 +0.172

− 5.35 − 5.35 24 52.03 − 6.24 53.53

18 56.28 18 57.15 +10 17.67 18 57.31 +10 16.13

+.5 +.5

18 50.93 51.80 −7.10 18 51.07 −7.30

53.362 54.232 3.10 53.502 35 2.86

55 35

+28.76 −46.69 +23.24 −35.93

55 55

1 −1.98 −1.93

2	45.7	3	39.3	2	48.7	3	31.0
	52.8		45.5		53.9		35.7
	98.5″		84.8		102.6		66.7
57	49.25	58	42.40	57	51.30	58	33.35

1.45788 1.66922 1.36624 1.65546n

1.31609 1.52743 1.22445 1.41367n

+20.71 −33.68 +16.77 −25.93

58 9.96 8.72 58 8.07 58 7.42

24 38.39 24 +39.63 24′ 40.28″ 40.93

40.60

−13 12 28 11 35 12 26 11 44

1.13080n 1.13030n 1.13070n 1.13030n

−1303 −2113

1.11777 1.11727 1.10957 1.10917

+13.11 +13.11 +12.87 +12.86

−23 −.08 −.52 −.14 +.06 −.31

+25 +.33 +.25 +.32

+13.13 +12.92 +12.98 +12.87

24 51.52 52.55 24 53.26 53.80

35 7.9 8.1

+10 19.8 14.3

+10 14.6

+10 17.58 18.03 +10 16.40 35 2.80

+ .45 26.03 2.45 + .44 16.84 3.34

− 7.10 3.48 − 7.30 26.23

+10 10.93 2.96 +10 9.54 35 3.07

44.03 34 49.14

Groom 38 1874 1874 1875

Gr. 2001 α 55.126 June 9 22ᵐ 59.37 2′ 55.2″ May 30 22ᵐ 61.82 1′ 9.25″

δ +2′ 46.14″

β m sec. dα/dt +1.517 14 59.09 -.28 55.8 +.6 June 4 61.57 -.25 93.4 +.9

13 22 57 dδ/dt −18.779 19 58.80 .29 56.3 .5 9 61.30 .27 94.1 .7

24 58.50 .30 56.7 .4 14 61.02 .28 94.7 .6

+73° 3′ 29 58.19 .31 56.9 .2 19 60.73 .29 95.2 .5

l.cosδ 9.46469 1875

ζ = −30° 40′ lb .10600 α 56.643 corr α = +.299ˢ

sin ζ = −.51 lb′ 9.57069 δ +2′ 27.36″ corr δ = +.15″

dα/dt +1.517

1875 dδ/dt −18.778 long δ = +3.29

l cos δ 9.46469

lb .12552 I = 7.09ˢ

lb′ 9.59021 k = −.052ˢ

1874 1875

l sin δ 9.98071 × −38 × 1874 −38 −55 −50 −44

May 26 June 15 June 17 May 26 June 8 June 15

Cl. f. −.317 −.410 −.552 −.485 −.453

22 49.1 22 26.0 — 22 22 34 22 22 20.0 22 21 59.8

52.6 31.4 22 53.3 3.92 46.6 7.5 48.0 28.2 47.0 4.0

56.3 35.8 56.8 .88 50.0 13.0 50.5 35.1 50.7 10.1

59.7 0.1 .64 53.5 53.7 54.2

3.3 3.7 .70 57.0 57.6 57.7

6.6 7.3 .76 23 0.9 23 1.1 1.3

10.3 23 12.7 — 4.2 23 8.8 4.8 23 24.3 4.9 23 14.5

14.0 19.4 — 7.9 15.2 8.4 30.2 8.6 21.2

17.3 26.5 — 11.3 21.7 11.8 35.0 11.9 27.2

14.8 15.4 15.5

2692 1212 390 2460 2505 2518

240 120 240 240 240

292 22 31.07 +2 60 22 7.97 105 22 27.77 1 18 21 2 4.63

23 ~~3.655~~ 23 19.53 23 ~~0.240~~ 3.780 23 0.667 23 15.23 23 1.167 23 29.83 23 1.311 23 20.97

3.244 −~~x~~ 2.51 −3.47 +3.25 +2.14 +1.44

3.192 −1.25 23 3.73 −1.25 0.615 −1.81 1.115 −1.65 1.259 −1.45

22 59.0~~42~~ 22 58.981 23 2.080 23 1.384 23 0.975

+4.157 23ᵐ −3.89 + 4.802 −3.78 −1.4239 −5.36 −0.253 −4.70 +0.29 31 −4.31

~~+4.47~~ +3.87 ~~0.56~~ ~~+5.12~~ +4.52 22ᵐ 55.23 −1.09 −1.69 56.~~07~~ .70 ~~+0.07~~ −0.53 56.~~80~~ .91 ~~+0.61~~ +0.01 56.94

22 23 55.59 22 .70 .87

− 2.58 − 3.38 + 3.23 + 2.12 + 1.46

− 1.04 − 1.35 − 1.82 − 1.59 − 1.49

52

− 3.89 −2.373 3694 − 3.78 −2.263 − 5.36 18 3331 − 4.70 3712 − 4.31 3979

− 7.51 +10 1767 − 8.51 +10 1613 − 3.95 −16 335 − 4.17 −16 559 − 4.34 −16 7.36

23 3.19 +1.0 23 3.73 +1.0 23 0.61 +11 23 1.11 +12 23 1.26 +12

−9.80 −4.70 −6.60 −7.40

22 55.68 73 2 45.81 22 55.22 22 56.66 2 26.36 22 56.94 2 26.13 22 56.92 2 26.24

57.197 56.737

32.17 29

+~~31.58~~ −16.~~88~~ +52.70 −14.56 +33.40 −28.66 +56.68 −19.66

30 30 0 0 0

′ ″ −198 −209 −196 −188

0 34.5 0 59.7 0 29.1 0 47.7 A.R. 4 15.1 4 41.8 4 20.8 4 44.5 4 7.0 4 38.6

36.5 0.1 35.9 53.4 38.5 6.3 44.4 6.9 28.9 59.4

710 1198 650 1011 536 1181 822 1114 359 980

30′ 35.50″ 30 59.90 30 32.50 30 50.55 4 26.80 4 54.05 4 31.10 4 55.70 4 17.95 4 49.00

1.50745 1.21192ₙ 1.72181 1.16316ₙ 1.52375 1.45728ₙ 1.75343 1.29358ₙ

1.07814 0.78261ₙ 1.31202 0.75337ₙ 1.11396 1.04749ₙ 1.34364 0.88379ₙ

+11.97 −6.06 +20.62 −5.67 +13.00 −11.16 +22.06 −7.65

30 44.47 30 44.49 4 47.32 4 48.38 4 44.10 4 44.64 4 40.01 4 41.35

52 3.88 3.86 18 1.03 59.97 18 4.25 3.81 18 8.34 7.00

3.87 0.50 4.03 7.67

− 30 39 45 39 27 39 21 38 54 39 30 38 59

1.53310ₙ 1.53300ₙ 1.53300ₙ 1.53290ₙ 1.53300ₙ 1.53254

−1303 −2113 −848 −277 −1175

1.52007 1.51998 1.52452 1.52442 1.53023 1.53013 1.52125 1.52115

+33.12 +33.11 +33.46 +33.45 +33.90 +33.89 +33.21 +33.20

−.16 −.04 −.03 −.41 −.64 −.03 −.17 −.80 −.12 −.49 −1.08 −.05

+.04 +.07 −.40 −.44 −.63 −.69 −.60 ~~77~~ −.67

−1.46

+ 33.00 + 33.15 + 32.65 + 32.98 + 33.10 + 33.08 + 31.95 + 32.29

52 36.88 37.01 18 33.68 32.95 33.35 36.89 40.29 39.29

~~37.01~~

2 5.59 2 3.21 3.40 3.48

+10 19.0 18.9 −16 16 0.8 3.3 2.9 8.3 4.5

+10 18.95 −16 12.0 3.10 5.00

+10 19.1 2 45.66 −16 1.1 2 26.57 3.0 26.01 4.8 27.12

+10 17.58 18.58 45.79 −16 3.47 2.41 25.84 − 5.73 4.74 25.55 − 6.72 5.77 26.12

+ 1.00 −28.58 + 1.06 + .99 + .95

− 9.80 2 45.72 − 4.70 2 26.21 − 6.60 25.78 − 7.40 26.62

+10 8.78 2 26.94 −16 4.11 − 11.34 − 13.17

B.A.C. 4513 foll.
h m sec.
13 24 55
+24° 53'
+ 17° 30'
sin z = +.30

1874
α
δ
dα/dt
dδ/dt

1875
24 56~~55~~62
52 5682
+ 2.848
− 18.69

l cos δ 9.95769 9.95769
l 6 .16600 .12552
l 6' .06369 .08321
l sin δ 9.62405

corr α =
corr δ =
long δ = +.46
I = 2.27 s
K = −.017 s

1874 May 26

1874 June 1
−355
23 48.6 23 40.8
50.7 43.1
52.9 45.3
57.6
59.9
2.3
4.4
6.6
11.2
13.4
15.7
32 ~~4~~ 3 3
300
2 ~~3~~ 3 23 43.07
24 ~~2.209~~
2.118
2.101
+ 53.60
− .16
− 1.75 +1.098
+ 51.69
24 2.10
24 53.79 56.638
53.79

1875 May 26
−552
24 42.2 24 28.9
44.4 30.8
46.6 32.8
51.2
53.5
55.8
58.0
0.2 25 18.6
4.9 20.9
7.0 23.3
9.3
3731
240
6131 24 30.83
24 55.736 25 20.93
55.719
+ 3.23
− .25
− 2.12
+ 0.86
24 55.72
24 56.58

June 8
−485
24 43.0 24 30.2
45.3 33.2
47.7 35.0
52.2
54.5
56.7
59.0 25 21.1
1.4 23.7
5.8 26.1
8.1
10.4
3841
240
6241 24 32.80
24 56.736 25 23.63
56.719
+ 2.12
− .22
− 2.02
− .012
24 56.72
24 56.60

June 14
−440
24 43.4 24 33.1
45.8 35.8
48.0 37.7
52.6
54.9
57.1
59.4 25 17.7
1.6 19.8
6.1 22.1
8.4
10.8
3881
240
6281 24 35.53
24 57.100 25 19.87
57.083
+ 1.41
− .20
− 1.97
− 0.46
24 57.08
24 56.62
56.600

35			35	+19.05 +~~19.14~~	10	+24.91	−25.19	10	+23.94	−26.89	10	+21.57	−22.77
'	"			−213		−2.09			−1.96			−1.91	
4	38.7	0 17.9	~~3~~ 4	8.1	2	52.8	3 53.4	2	50.3	3 52.8	2	52.0	3 45.8
	45.1	25.8		16.8		16.8	16.9		13.2	14.9		14.7	7.5
	838	437		249		129.6	130.3		123.5	127.7		126.1	113.3
39	41.90	40 21.85	~~38~~ 39	12.45	13	4.80	14 5.15	13	1.75	14 3.85	13	3.35	13 56.65
				1.27989		1.39637	1.40123		1.37912	1.42959		1.33385	1.35736
				1.34358		1.47958	1.48444		1.46383	1.51280		1.41706	1.44057
				+22.06		+30.17	−30.51		+28.99	−32.57		+26.13	−27.58
			~~38~~ 9	34.51	13	34.97	13 34.64	13	30.74	13 31.28	13	29.48	13 29.07
		+24°	4 ~~4~~ 3	13.84	25° 9	13.38 13.54	13.71	9	17.61 17.34	17.07	9	18.87 19.07	19.28
		+17	27	55		29 17	30 17					29 15	30 9
				1.25810		1.25870	1.25910					1.25870	1.25910
				−512		−836			−267			−701	
				1.25298		1.25034	1.25074		1.25603	1.25643		1.25169	1.25209
				−17.91		−17.80	−17.81		−18.03	−18.05		−17.85	−17.87
				−.07 ~~+.09~~		−.11 −.24	−.12		−.10 −.61	−.13		−.08 −.57	−.09
				+.13 +.06		−.28	−.37		−.42	−.57		−.43	−.55
				−17.85		−18.19	−18.30		−18.55	−18.75		−18.36	−18.51
		+24	4~~3~~2	55.99	25° 8	55.19	55.41	8	59.06	58.32	9	0.51	0.77
			+10	18.11 17.47 .64 +16.36 − +2.33	−16	3.47 4.10 − .63 +5.62			−5.73 6.32 − .59 +3.81			−7.28 7.85 − .57 +3.08	
			+10	19.80	−15	58.48	52 56.71 56.93	−16	2.52	56.54 55.80	16	4.77	55.41 56.00
			5~~3~~	15.79			52 56.82			56.17			55.87
			5~~3~~2	57.10									

47

ζ Virginis

h m sec.
13 28 19

+0° 3'

Co ζ = +42° 20'

~~Cos δ~~ = Sin ζ = +.67

Lang ρ +.00
= s
I = +2.06
K = -.015 s

1874
α 2 16.413 s
δ +2' 56.49
dα/dt +3.052
dδ/dt -18.534

l cos δ .00000
l c .10600
l c' .10600

1875
l cos δ .00000
l c .12552
l c' .12552

l sin δ 6.94085

1874

May	20	28 17.96		2' 46.4
	25	17.95	-.01	46.7 +.3
	30	17.93	.02	47.0 .3
June	4	17.91	.02	47.3 .3
	9	17.88	.03	47.7 .4
	14	17.85	.03	48.0 .3
	19	17.82	.03	48.3 .3
	24	17.78	.04	48.6 .3
	29	17.74	.04	49.0 .4

1875

May	20	28 21.34		2' 25.5
	25	21.33	-.01	25.8 +.3
	30	21.31	.02	26.1 .3
June	4	21.29	.02	26.4 .3
	9	21.26	.03	26.8 .4
	14	21.23	.03	27.1 .3
	19	21.20	.03	27.4 .3
	24	21.16	.04	27.7 .3
	29	21.12	.04	28.1 .4

Cor α =
Cor δ =

1875
α 19.466 s
δ +2' 37.96
dα/dt +3.052
dδ/dt -18.532

	1874				1875							
	x -35 June 1 -.355		x -38 June 15 -.317		May 27 Chf		~~Add~~ -44 May 29 -.488		-50 June 8 -.485		-45 June 14 -.440	
13	27 12.0 14.0 16.1 20.2 22.2 24.4 26.4 28.6 32.6 34.6 36.7	27 1.2 4.0 6.8 27 50.2 52.0 53.6	28 8.1 10.1 12.2 16.3 18.4 20.4 22.5 24.6 28.7 30.8 32.8	27 57.4 59.4 1.3 28 38.2 39.9 42.0			28 5.9 8.0 10.0 14.2 16.2 18.3 20.3 22.5 26.4 28.6 30.7	27 55.1 57.3 59.2 28 39.5 42.0 43.7	28 6.7 8.7 10.9 15.0 17.0 19.1 21.3 23.3 27.4 29.6 31.6	27 59.5 1.5 3.6 28 35.7 37.7 39.3	28 7.1 9.3 11.3 15.3 17.5 19.6 21.6 23.7 27.8 29.8 32.0	28 1.1 3.3 5.1 28 39.8 42.3 44.5
	26.78 27 24.345	27 4.00 27 51.93	22.49 28 20.445	27 59.37 28 40.03			20.11 28 18.282	27 57.20 28 41.73	21.06 28 19.145	~~27~~ 28 1.50 ~~1.17~~ 28 37.57	21.50 28 19.545	28 3.17 28 42.20
	24.330 28 17.92 -53.59	+53.61 +00	20.430 28 17.84 +2.59	~~+~~ -2.51 +00			18.267 28 21.31 - ~~2.04~~ ~~2.01~~ 3.04	+3.12 +00	19.130 28 21.27 -2.14	+2.14 +00	19.530 28 21.23 -1.70	+1.69 +00
	+ 53.60 ± .00 - 1.51 + 52.09 27 24.33 28 16.42 19.472	-1.51 28 16.43 +1.542 52 29.77 +10 18.19 -1.4 +9.40 +0 2 55.98	- 2.58 - .00 - 1.43 - 4.01 28 20.43 28 16.42 19.472	-1.43 16.49 +1.622 52 31.59 +10 17.69 -1.2 +8.40 2 56.46			+ 3.11 - .00 - 1.84 + 1.27 28 19.28 28 19.54	-1.84 19.2455 19 18 33.09 -16 4.98 -1.6 +11.90 2 38.41	+ 2.12 - .00 - 1.80 + 0.32 28 19.13 28 19.45	-1.80 19.47 33.41 -16 5.59 -1.5 +11.30 2 39.62	+ 1.41 - .00 - 1.76 - 0.05 28 19.53 28 19.48	-1.76 19.46 33.98 -16 7.14 -1.6 +10.90 2 36.14
	25 +20.34 -2.13	-27.59	25 +21.07 -1.98	-19.59	0		0 +21.08 -2.06	-23.45	0 +17.64 -1.96	-18.43	0 +16.37 -1.91	-22.66
	3 54.4 6.9 121.3 29 0.65	4 55.5 9.5 125.0 29 (30) 2.50	3 53.2 6.7 119.9 28 59.95	4 43.9 57.7 101.6 29 50.80	2 53.7 13.8 127.5 28 3.75	3 52.2 12.7 124.9 4 2.45	2 45.1 3.4 108.5 2 54.25	3 45.0 3.1 108.1 3 54.05	2 48.8 9.1 117.9 2 58.95	3 37.6 56.1 93.7 3 46.85	2 51.9 10.7 122.6 3 1.30	3 42.9 0.5 103.4 3 51.70
	1.30835 1.41435 +25.96 29 26.61	1.44075 1.54675 -35.22 29 27.28	1.32366 1.42966 +26.89 29 26.84	1.29203 1.39803 -25.01 29 25.79			1.32387 1.44939 +28.14 3 22.39	1.37014 1.49566 -31.31 3 22.74	1.24650 1.37202 +23.55 3 22.50	1.26553 1.39105 -24.67 3 22.24	1.21405 1.33957 +21.86 3 23.16	1.35526 1.48078 -30.25 3 21.45
↙ 0° +42	53 21.74 21.40 18 44 1.71910 -498 1.71412 -51.78	21.07 19 45 1.71930 1.71432 -51.80	53 21.51 22.03 18 43 1.71910 -1303 1.70607 -50.83	22.56 19 34 1.71930 1.70627 -50.85			19 25.96 25.78 19 6 1.71920 -154 1.71766 -52.20	25.61 20 6 1.71940 1.71786 -52.22	19 25.85 25.98 -255 1.71665 -52.08	26.11 1.71685 -52.10	19 25.19 26.04 19 13 1.71920 -686 1.71234 -51.56	26.90 20 4 1.71940 1.71254 -51.59
	-.020 +18 +16 -51.62 52 30.12 2 47.1 +0 17.0 +10 17.3 +10 18.11 - 1.42 + 9.40 +10 26.09	-.020 +.00 20 -51.60 29.47 17.6 2 56.21 16.69 55.56 -9.13 2 55.88 2 37.35	-.020 +39 +36 -50.47 31.04 48.1 17.1 16.5 + 17.58 - 1.32 + 8.40 + 24.66	-.020 +43 -50.92 32.14 16.0 16.26 55.70 -10.13 56.80 56.25 34.72			-.02 σ -48 -.26 41 -52.61 18 33.35 26.1 -16 7.2 -16 6.9 -16 5.28 - 1.38 + 11.90 -15 54.76	-.03 σ -.35 -52.77 32.84 6.7 2 38.59 6.66 38.08 2 38.33	-.0x σ .47 -.42 -52.50 33.35 26.7 6.7 6.7 - 5.73 - 1.31 + 11.30 - 55.74	-.01 σ -.53 -52.63 33.48 6.8 7.04 37.61 37.74 37.67	-.0x σ -.48 -.42 -51.98 38.21 27.1 6.1 8.9 - 7.28 - 1.27 + 10.90 - 57.65	-.02 -.55 -52.14 34.76 7.7 8.55 35.56 37.11 36.33

5 Cam. Ven. um

h m sec.
3 31 54,

+ 36° 56

~~+ 5° 23'~~
g = + 5 27
δ sin z = +.09

	1874	1875
α		31 54.36
δ		55 53.27
dα/dT		+ 2.673
dδ/dT		− 18.44
l.cosδ	9.90273	9.90273
l.C	.10600	.12552
l.C'	.00873	.02825
l.sinδ	9.77879	

cont =
cont =

tanδ = +.75
I = 2.59 s
K = −.020 s

1874 — June 1 / June 15 — 1874 June 21 — 1875 — May 27 / May 29 / June 8

−.355 −.317 −.510 −.488 −.485

30 44.9 30 37.3 31 40.8 31 34.6 31 38.3 31 25.5 31 38.6 31 26.5 31 39.4 31 26.0
47.5 39.7 43.4 37.6 40.8 28.7 41.0 28.7 42.0 28.3
50.2 42.3 46.1 39.2 43.5 30.5 43.6 31.0 44.6 30.3
55.2 51.1 48.6 48.8 49.7
57.7 53.7 51.3 51.3 52.2
0.3 56.4 53.8 54.0 54.9
3.0 31 31.8 59.9 32 26.6 56.4 32 15.7 56.6 32 16.7 57.4 32 13.6
5.4 84.9 1.5 29.5 59.0 17.6 59.2 18.4 0.1 16.2
10.7 87.2 6.7 32.4 4.0 20.4 4.3 20.4 5.1 18.6
13.1 9.2 6.6 6.9 7.7
15.7 12.0 9.2 9.5 10.4

3037 3801 (8) 4115 4138 3635
300 240 180 180 240
37 30 39.77 ~~6208~~ 31 37.13 591 5 31 28.23 5938 31 28.73 603 5 31 28.20
31 0.336 31 34.63 31 ~~56.373~~ 32 29.50 31 53.773 32 17.90 31 53.982 32 18.50 31 54.864 32 16.13
56.436
0.316 56.416 53.753 53.962 54.844

+ 53.60 − 2.58 + 3.29 + 3.11 + 2.12
− .27 − .24 − .38 − .37 − .36
− 2.00 +0.673 − 1.84 +0.833 − 2.38 − 2.37 − 2.27
+ 51.33 − 4.66 + 0.53 + 0.37 − 0.51
31 0.32 31 56.42 31 53.75 31 53.96 31 54.84

31 51.65 31 51.76 31 54.28 31 54.33 31 54.33
~~54.353~~ 54483
54.323 51.720 54.313

+ 20.57 − 34.29 +19.31 ~~+19.24~~ −33.06 ~~33.13~~ + 25.54 − 24.13 + 25.25 − 24.52 + 26.66 − 21.27
35 35 35 10 10 10

− 2.13 − 1.98 − 2.07 − 2.06 − 1.96
1 24.0 2 20.9 1 21.9 2 15.7 1 24.0 1 1.0 0 9.4 1 2.5 0 8.7 1 2.2 0 4.7 0 55.5
33.2 30.0 31.8 26.7 31.1 6.4 34.5 26.0 30.0 23.8 27.1 18.9
57.2 50.9 53.7 42.4 55.1 7.4 43.9 28.5 38.7 26.0 31.8 134.4
36 28.60 37 25.45 36 26.85 37 21.20 36 27.55 36 3.70 10 21.95 11 14.25 10 19.35 11 13.00 10 15.90 11 7.20

1.31323 1.53517n 1.28578 1.51930n 1.40722 1.38256n 1.40226 1.38952n 1.42586 1.32777n
1.32196 1.54390n 1.29457 1.52803n 1.43547 1.41081n 1.43051 1.41777n 1.45411 1.35602n
+ 20.98 − 34.99 + 19.70 − 33.73 + 27.26 − 25.75 + 26.95 − 26.17 + 28.45 − 22.70
36 49.58 36 50.46 36 46.55 36 48.47 10 49.21 10 48.50 10 46.30 10 46.83 10 44.35 10 44.50

+36°
45 58.77 57.89 46 1.80 45 59.88 11 59.14 59.85 12 2.05 1.52 12 4.00 3.85
58.33 0.84 59.49 1.78 3.92

+5 26 12 27 8 26 10 27 4 26 34 27 26 26 28 27 19
0.73890 0.74000 0.73890 0.74000 0.73940 0.74050 0.73930 0.74030
−486 −130.3 −376 −142 −240
.73404 .73514 .72587 .72650 .73564 .73674 .73798 .73908 .73690 .73790
− 5.42 − 5.43 − 5.32 − 5.33 − 5.44 − 5.45 − 5.47 − 5.48 − 5.46 − 5.47

−.11 −.12 −.30 −.10 −.02 −.29 −.17 −.23 −.15 −.17 −.26 −.15 −.18 −.24 −.11
+.06 +.10 +.13 +.22 −.04 −.11 −.04 −.17 −.04 −.15
− 5.47 − 5.63 − 5.29 − 5.40 − 5.65 − 5.71 − 5.68 − 5.40 − 5.68 − 5.73
+36 45 53.30 52.26 45 56.51 54.48 11 53.49 54.14 11 56.37 55.72 11 58.32 58.12
+10 18.11 17.92 + 17.58 17.40 −16 4.01 4.20 − 5.28 5.47 − 5.73 5.91
− .19 −18.86 − .18 −20.95 − .19 − .19 − .18
−0.42 ∓ 2.51 − 2.89 − 2.53 − 0.90

+10 17.50 56 10.80 + 14.89 11.40 −16 7.09 55 46.40 − 8.00 48.37 − 6.81 51.51
9.76 9.37 47.05 47.72 51.31

56 10.28 10.38 55 46.72 48.05 51.41
55 51.84 51.94

Groom 5?

Gr. 2029.

13h 34m 11sec

1874 +71° 53′ 1875

α 9.444 10.875

δ +53.1.7 29° 30′ +52 43.39

+1.431 δsin z = -.49 +1.431

-18.375 -18.374

l cos δ 9.49269 9.49269

l b .10600 .12552

l b′ 9.59869 9.61821

1874

May 30 34m 14s.03 52′ 68″.3

June 4 13.81 -.22 69.2 +.9

9 13.57 .24 70.0 .8

14 13.32 .25 70.7 .7

19 13.06 .27 71.2 .5

l sin δ 9.97792

1875

May 30 34m 15s.85 52′ 47″.4

June 4 15.62 -.23 48.4 +1.0

9 15.38 .24 49.2 .8

14 15.13 .25 49.9 .7

19 14.86 .27 50.5 .6

Corr α = +.104s

Corr δ = -.26″

tang δ = +3.06

I = 6.64s

K = -.049s

× 1874 -.35 June 1 -.355

× 1874 -.38 June 15 -.314

1875 -.52 May 27 -.510

-.44 May 29 -.488

-.50 June 8 -.485

-.51 June 20 -.508

13 33 8.7 32 47.9 — 34 1.3 34 8.4 34 1.0 33 16.5 34 1.7 33 28.6 34 2.9 34 0.7

11.8 53.1 — 4.2 12.2 4.2 21.6 5.0 33.5 6.1

15.2 0.7 — 8.0 19.6 7.5 27.5 8.4 40.0 9.4

18.4 — 10.8 10.8 11.9 12.6

21.9 — 14.2 13.8 15.0 16.0

25.0 — 17.1 17.7 18.5 19.2

28.2 33 41.3 34 44.2 (34 58.3 20.9 21.3 34 33.3 21.9 34 12.5 22.5 35 19.3

31.6 47.9 50.3 17.24 .10 4.5 24.3 24.6 37.5 25.1 14.1 26.0 27.3

34.7 56.0 57.1 .26 9.9 27.6 28.0 44.8 28.4 23.2 29.0 32.5

19.55 32 53.90 12.84 34 13.40 12.89 33 21.87 13.59 33 34.03 14.37 34 0.70

33 21.722 33 48.40 34 17.34 35 4.23 34 14.267 34 14.322 34 38.53 34 15.100 34 17.60 34 15.967 35 26.37

21.673 34 17.59 14.218 14.273 15.051 15.918

34 13.987 34 13.286 34 16.001598 34 15.9189 34 15.442 34 14.8279

-52.28 30 + 4.0×3 -1.786 -1.642 -0.387 +1.103

+53.61 -2.51 +3.28 +3.13 +2.15 +0.54

+ 53.60 -1.07 - 2.58 -1.196 + 3.29 -1.59 + 3.11 -1.35 + 2.12 -1.53 + 0.46 -1.56

- 1.09 - .97 - 1.56 - 1.49 - 1.48 - 1.55

- 4.543 -3.099 -4.53 - 3.82 -2.389 -3.82 - 5.11 -5.11 - 5.02 -5.02 - 4.55 -4.55 - 3.92 -3.92

+ 47.98 34 ~~9.82~~ .66 - 7.37 9.80 - 3.38 10.79 .80 - 3.40 11.03 - 3.91 11.12 - 5.01 10.98

33 21.67 9.68 34 17.29 ~~9.60~~ 34 14.22 ~~10~~ 34 14.27 34 15.05 34 15.92

34 9.65 34 9.92 34 10.84 34 10.87 34 11.14 34 10.91

11.081 42 47.95 11.351 42 51.83 8 48.63 49.96 52.03 55.60

+10 18.19 +10 17.67 -16 35.9 -16 4.98 -16 5.59 -16 6.38

+ 1.1 + 1.0 + 1.1 + 1.0 + 1.2 + 1.2

- 6.90 = 9.10 - 3.40 - 3.90 - 5.70 - 7.20

+71 53 0.34 53 1.40 52 42.74 52 42.08 52 41.94 52 ~~43.22~~ 43.22

+27.82 -26.68 -46.89 + 0.87 + 52.45 - 24.21 + 41.07 - 2.50 + 15.27 - 70.40

40 40 10 10 10 10

-2.13 -1.98 -2.07 -2.06 -1.96 -1.89

0 19.0 0 40.5 0 43.0 3 51.1 4 19.6 3 58.0 4 29.7 4 0.8 4 17.8 4 5.3 4 40.4

24.1 45.6 49.9 14.5 42.9 18.7 50.0 20.9 40.3 27.5 5.4

43.1 86.1 92.9 125.6 62.5 136.7 79.7 21.7 58.1 32.8 105.8

40′ 21.55″ 40 43.05 40 46.45 14 2.80 14 31.25 14 8.35 14 39.85 14 10.85 14 29.05 14 16.40 14 52.90

1.44436 1.42619 1.67108n 0.93952 1.71975 1.38399n 1.61352 0.39794n 1.18384 1.84757n

1.04305 1.02488n 1.26977n 9.55973 1.33796 1.00220n 1.23173 0.01615n 0.80205 1.46578n

+11.04 -10.59 -18.61 +0.36 +0.36 +21.77 -10.05 +17.05 -1.04 +6.34 -29.23

40 32.59 40 32.46 40 27.84 14 3.16 14 31.61 14 30.12 14 29.80 14 27.90 14 28.01 14 22.74 14 23.67

+71° 42′ 15″.76 15.89 42 20.51 8 45.19 8 16.74 8 18.23 18.55 8 20.45 20.34 8 25.61 24.68

15.82 18.39 20.39 25.14

-29 29 55 29 34 29 31 29 45 29 17 29 32 28 55

1.51280n 1.51270n 1.51270n 1.51270n 1.51260n 1.51270 1.51250

-478 -1303 -360 -134 -230 -1164

1.50802 1.50792 1.49967 1.50910 1.50900 1.51136 1.51126 1.51040 1.51030 1.50106 1.50086

+32.21 +32.21 +31.60 +32.29 +32.29 +32.46 +32.45 +32.39 +32.38 +31.70 +31.68

-.12 -.08 -.10 -.35 ~~-.14~~ -.28 - 0 -.38 - 0 -.44 -.88 -.09 -.28 -.75 - 0 -.03 -1.23 .77 -.79

+.02 +.03 +.07 -.36 -.40 -.57 -.66 -.59 -.63 -.60 -.88

+ 32.11 +32.14 + 31.32 + 31.93 + 31.89 + 31.45 + 31.70 + 31.52 + 31.75 + 30.90 + 30.01

42 47.87 48.03 51.83 8 48.63 49.68 50.26 51.97 52.09 56.57 54.69

53 8.7 10.89 52 46.8 46.8 47.3 49.1 50.6

+10 20.8 20.7 19.1 ~~18.8~~ -16 1.8 2.4 2.9 2.9 3.0 5.9 4.1

+10 20.75 19.10 -16 2.10 2.65 ~~2.90~~ 2.95 6.00

+10 20.5 53 0.12 18.8 -16 2.4 3.00 2.9 41.50 3.2 41.50 6.3 43.53

+10 18.11 19.16 0.28 + 17.58 18.55 -16 4.01 - 5.28 4.28 42.07 - 5.73 4.77 41.62 - 6.70 5.78 41.71

+ 1.04 25.27 + .97 -27.47 + 1.01 + 1.00 + .96 + .92

- 6.90 53 0.20 - 9.10 1.28 - 3.40 52 42.23 - 3.90 41.78 - 5.70 41.56 - 7.20 42.62

+10 12.25 52 41.83 + 9.45 42.91 -16 6.40 - 8.18 - 10.47 - 12.98

53 Virginis

		1874	1875
h m sec. 13 37 44	α		37 45.34
−15° 33′	δ		32 58.15
	dα/dt		+ 3.226
	dδ/dt		− 18.27
φ + 57° 56′	l cos δ	9.98381	9.98381
sin z = +.85	l b	.10992	.12552
	l b′	.09373	.10933
	l b′	.08981	
	l sin δ	9.42826n	

const =
const δ =

tang δ′ = −.28

I = 2.14 s

k = −.016 s

1874				1874		1875					
May 28		~ June 1		June 15		May 27		May 29		June 8	
−.297		−.356		−.317		−.510		−.488		−.485	
13 36 38.5 40.7 42.8 47.2 49.3 51.4 53.5 55.6 0.0 2.2 4.2	36 28.5 30.4 32.0 37 13.8 15.8 17.4	36 37.1 39.2 41.3 45.6 47.7 49.9 52.1 54.3 58.5 0.6 2.8	36 26.1 28.8 31.1 37 9.0 11.1 13.0	37 33.2 35.2 37.4 41.7 43.9 46.0 48.1 50.4 54.5 56.7 58.8	37 22.0 30.8 32.4	37 26.9 29.0 31.0 35.5 37.6 39.7 41.8 43.9	37 18.1 19.4 21.1 37 50.0 51.9 53.9	37 31.0 33.1 35.3 39.7 41.9 44.0 46.1 48.2 52.5 54.7 56.9	37 22.2 24.2 26.3 37 57.5 59.4 1.7	37 32.0 34.2 36.4 40.6 42.7 45.0 47.1 49.2 53.4 55.6 57.7	37 23.0 25.4 27.3 38 1.4 3.7 5.1
3854 180 5654 36 51.400 51.384	36 30.30 37 15.67	4291 120 5491 36 49.918 49.902	36 28.67 37 11.03	5059 37 45.991 45.975	37 30.73		37 19.53 37 51.93	4834 37 43.945 43.929	37 ~~24.10~~ 24.23 37 59.53	4939 37 44.900 44.884	37 25.23 38 3.40
+ 52.09 + .08 − 1.52 + 50.65 36 51.38 37 42.03 45.256	+1.706	+ 53.60 + .10 − 1.51 + 52.19 36 49.90 37 42.09 45.316	+1.716	− 2.59 + .09 − 1.43 − 3.93 37 45.97 37 42.04 42.040	+1.796 45.266	+ 3.29 + .14 − 1.84 + 1.59		+ 3.11 + .14 − 1.83 + 1.42 37 43.93 37 45.35		+ 2.12 + .13 − 1.79 + 0.46 37 44.88 37 45.34 45.345	
0 +21.10 −2.14 3 50.6 9.9 120.5 4′ 0.25″	−24.27 4 46.4 6.9 113.3 4 56.65	0 +21.25 −2.13 3 54.8 9.5 124.3 4 2.15	−21.11 4 46.8 2.1 108.9 4 54.45	0 +15.26 −1.98 3 1.3 19.1 20.4 3 10.20		35 2 50.7 11.0 121.7 38 0.85	3 34.7 54.2 88.9 38 44.45	35 +19.71 −2.06 2 48.2 6.7 114.9 37 57.45	−15.59 3 33.1 51.2 84.3 38 42.15	35 +18.~~6~~9 67 −1.96 2 47.8 7.9 115.7 37 57.85	−18.50 3 38.2 55.2 93.4 38 46.70
1.32428 1.41801 +26.19 4 26.44	1.38507n 1.47880 −30.12 4 26.53	n1.32736 n1.41717 +26.13 4 28.28	1.32449 1.41430 −25.96 4 28.49	n1.18355 1.27336 +18.77 4 28.97				1.29469 1.40482 +25.36 38 32.81	n1.19285 n1.30218 − 20.05 38 32.10	n1.29380 n1.40313 +25.30 38 23.15	1.26717n 1.37650n −23.80 38 22.90
−15° 41 38.09″ 38.13 +57 53 43 1.96148 −585 1.95563 −90.29 − 1 +.06 .00	38.18 54 40 1.96176 1.95591 −90.35 − 1 +.07 +.08 .00	41 39.93 40.03 53 45 1.96148 −466 1.95682 −90.54 0 +.06 +.16	40.14 54 37 1.96173 1.95707 −90.59 0 +.24 +.06 +.20	41 40.62 −1303 1.94870 −88.86 − 1 +.03 +.29	~~+.16~~ +.32			15 34.46 34.10 54 9 1.96162 −122 1.96040 −91.29 0 +.05 −.41	33.75 54 54 1.96181 1.96058 −91.33 0 −.42 +.03 −.52	15 34.80 34.67 54 10 1.96162 −215 1.95947 −91.09 − 1 +.05 −.41	34.55 54 59 1.96184 1.95969 −91.13 − 1 −.42 +.04 −.53
−1 30.44 −15 48 8.33 +10 16.63 − 1.81 +13.48 +10 28.30	−1 30.28 8.46 14.82 −4.79 32 40.03 40.16 32 40.09 32 58.36	−1 30.32 43 10.25 + 18.11 − 1.81 +13.48 + 29.78	−1 30.33 10.47 16.30 −4.77 40.~~83~~ 47 40.~~75~~ 69 40.~~74~~ 58 ~~58.41~~ 58.85	−1 28.55 43 9.17 + 17.58 − 1.68 +13.35 + 29.25	15.90 −4.92 ~~38.42~~ 39.92 ~~56.69~~ 58.19	+15.88		−1 31.65 17 6.11 −16 5.28 − 1.75 +15.89 −15 51.14	−1 31.82 5.57 7.03 32 57.25 56.71 56.98	−1 31.46 17 6.26 −16 5.73 − 1.66 +15.86 − 51.53	−1 31.63 6.18 7.39 57.49 57.41 57.75

87 Virginis
h m sec
13 40 37
−17° 14′
φ = + 59° 37′
sin φ = +.86

	1874	1875
α,		40 37.64
δ		13 59.59
dα/dt		+ 3.251
dδ/dt		− 18.20
log cos δ	9.98005	9.98005
log b	.10992	.12552
log b′	.08997	.10557
log b′	.08605	
log sin δ	9.47168n	

corr α =
corr δ =
lat g δ = −.31
I = 2.16 s
K = −.016 s

+4s

1874 May 27		1874 May 28		1874 June 1		1874 June 15		1875 May 27		1875 June 8	
−.283		−.297		−.355		−.317		−.510		−.485	
13 39 31.0	39 16.9	39 30.7	39 25.5	39 29.2	39 18.8	41 35.3	41 22.2	40 19.1	40 9.3	40 24.2	40 18.0
33.1	19.0	32.8	27.3	31.4	21.0	27.4	24.0	21.2	16.9	26.4	19.9
35.3	21.3	35.0	29.3	33.6	23.1	29.6	25.0	23.5	13.1	28.5	21.4
39.6		39.3		37.7		34.0		27.7		32.8	
41.8		41.4		39.9		36.2		29.9		34.9	
44.0		43.7		42.1		38.4		32.1		37.2	
46.0	40 0.0	45.9	39 53.1	44.3	39 57.2	40.4		34.3	40 42.6	39.3	41 58.4
48.4	1.4	48.1	53.0	46.5	0.0	42.7		36.4	44.3	41.4	0.3
52.6	2.7	52.4	56.2	50.7	2.0	46.9		40.8	46.2	45.7	2.9
54.6		54.5		53.0		49.2		43.0		47.9	
57.0		56.8		55.1		51.3		45.0		50.0	
48 3 4	39 19.07	48 0 6	39 27.37	46 3 5	39 20.97	42 1 4	41 23.73	35.30	40 11.03	40 8 3	40 19.70
39 43.945	40 1.37	39 43.691	39 54.77	39 42.136	39 59.73	41 38.309		40 32.091	40 48.37	40 37.118	41 0.53
43.929		43.675		42.120		38.293		32.075		37.102	
+ 51.71		+ 52.09		+ 53.60		− 2.59		+ 3.29		+ 2.12	
+ .09		+ .06		+ .11		+ 10		+ .16		+ .15	
− 1.54 +1.711		− 1.53 +1.721		− 1.52 +1.731		− 1.45 +1.801		− 1.85		− 1.81	
+ 50.26		+ 50.65		+ 52.19		− 3.94		+ 1.60		+ 0.46	
39 43.93		39 43.67		39 42.12		41 38.29		40 32.07 6		40 37.10	
40 34.19		40 34.32		40 34.31		41 34.36		40 32.67		40 37.56	
37.441		37.571		37.561		37.601 34.327					
40 +24.87	−17.43	40 +16.32	−11.08	40 +21.17	−17.59	45 +14.58		15 +21.06	−12.28	15 +17.42	−23.42
− 2.17		− 2.14		− 2.13		− 1.98		− 2.07		− 1.96	
4 41.5	0 32.6	4 52.9	0 25.6	4 50.0	0 37.2	0 57.5		3 44.0	4 25.6	3 46.8	4 38.3
57.8	48.1	12.4	46.1	6.2	53.0	16.1		4.1	46.0	6.3	57.2
99.3	80.7	125.3	71.7	116.2	90.2	123.6		108.1	71.6	113.1	95.5
44 49.65	45 40.35	45 2.65	45 35.85	44 58.10	45 45.10	45 6.80		18 54.05	19 35.80	18 56.55	19 47.75
1.39568	1.24130n	1.21272	1.04454n	1.32572	1.24527n	1.16376		1.32346	1.08920n	1.24105	1.36959n
1.48565	1.33127n	1.30269	1.13451n	1.41177	1.33132n	1.24981		1.42903	1.19477n	1.34662	1.47516n
+30.60	−21.44	+20.08	−13.63	+25.81	−21.44	+17.78		+26.86	−15.66	+22.21	−29.86 ~~−31.78~~
45 20.25	45 18.91	45 22.73	45 22.22	45 23.91	45 23.66	45 24.58		19 20.91	19 20.14	19 18.76	19 ~~15.97~~ 17.89
−17° 22 21.90	30.56	22 34.38	33.87	22 35.56	35.31	22 36.23		56 32.56	31.79	56 30.41	56 29.54
31.23		34.12		35.43				32.17		29.97	
+59 34 33	35 23			34 41	35 28			35 6	35 48		
1.99005	1.99028			1.99008	1.99031			1.99019	1.99039		
−231		−566		−457		−1303		−316		−202	
1.98774	1.98798	1.98439	1.98462	1.98551	1.98574	1.97705	1.97728	1.98703	1.98723	1.98807	1.98837
−97.22	−97.27	−96.47	−96.52	−96.72	−96.77	−94.85	−94.90	−97.06	−97.10	−97.30	97.36 ~~97.62~~
−1	−1	−1	−1	0	0	−1		−1	−1	−1	−1
+.09 +.06	+.04	+.03 +.02	+.02	+.07 +.17	+.04	+.03 ~~+.02~~ +.04		+.07 −.33	+.02	+.04 −.55	+.08
.00	.00	.00	.00	+20	+03	+01		−35	−41	−55	−67
−1 37.14	−1 37.24	−1 36.45	−1 36.51	−1 36.45	−1 36.70	−1 34.82		−1 37.35	−1 37.50	−1 37.82	−1 37.96 ~~40.22~~
−17 24 9.04	7.80	24 10.83	10.38	24 12.01	12.06	24 11.05		58 9.91	9.29	58 8.23	~~7.76~~
+10 15.31	13.45	+16.63	14.79	+18.11	16.28	+17.58	15.88	−16 4.01	3.79	− 5.73	7.41 7.50
− 1.86	−4.34	− 1.84	−4.33	− 1.83	−4.29	− 1.70	−4.34	− 1.78		− 1.68	
+13.86		+13.87		+13.91		+13.86		+16.26		+16.33	
+10 27.31	13 41.73	+ 28.66	42.17	+ 30.19	41.82	+ 29.74		−15 49.53	13 59.44	51.08	59.31
	40.49		41.72		41.82				58.82		58.58
	13 41.11		41.94		41.82		41.31 ~~40.79~~		13 59.13		~~60.07~~
	13 59.31		60.14		60.02		59.51 ~~58.99~~				58.94

1875

June 20

.508

40 25.8 40 13.4
28.0 15.5
30.1 17.2
34.4
36.5
38.8
41.0 41 0.3
43.1 2.2
47.4 4.4
49.6
51.7

4264 40 15.37
40 38.764 41 2.30

38.748

+ 0.46
+ .16
- 1.73
- 1.11
40 38.75

40 37.64

37.623

+23.39 -23.54
15

-1.89
3 40.7 4 40.2
0.1 59.1
1008 993
18 50.40 19 49.65

1.36903 1.37181
1.47460 1.47738
+29.83 -30.02
19 20.20 19 19.63

56 31.88 31.28
31.58

35 2 36 2
1.99016 1.990457
-1114
1.97902 1.97931
-9529 -9535
- 1 - 1
+08 -69 +08
-68 -86
-1 38.90 -1 36.14
58 7.78 7.42
-16 6.70 8.32
1.62
+16.19
-15 52.13 59.91
59.55

13 59.73

7

η ~~Ursae~~ Majoris

h m sec.
13 42 37
+ 49° 56'

z = − 7° 33' cons α =
l sin z = −.13 cons δ =

l tang δ = +1.19
t = 3.21 s
k = −.024 s

1874
May 20 42m 37.06s
25 37.00 −.06
30 36.93 .07
June 4 36.86 .07
9 36.78 .08
14 36.69 .09
19 36.60 .09
24 36.50 .10
29 36.40 .10

56' 33.8"
35.0 +12
36.0 1.0
36.9 .9
37.8 .9
38.6 .8
39.3 .7
39.9 .6
40.4 .5

1874
α 34.452 s
δ +56 33.80
dα/dt +2.373
dδ/dt −18.098
l cos δ 9.80867
l C .10992
l C' 9.91859
l C' 9.91467
l sin δ 9.88383

1875
36.825
+56 15.70
+2.373
−18.096
9.80867
.12552
9.93419

X 1874 −22 May 27 −.283
X −.31 May 28 +.297
X −35 June 1 −.355
X −.42 June 8 −.324
X −.38 June 15 −.317
X −.40 June 18 −.410

13 41 26.3 41 11.3 41 26.0 41 8.6 41 24.6 41 10.5 41 21.5 42 20.4 42 32.5 42 22.1 42 12.1
29.6 14.5 29.3 11.2 27.8 13.8 24.6 23.6 35.7 26.2 19.5
32.7 17.7 32.5 13.8 31.0 17.3 27.9 26.8 38.4 28.4 22.5
39.1 38.9 37.5 34.3 33.3 34.8
42.3 42.0 40.5 37.3 36.5 38.0
45.7 45.2 43.7 40.7 39.5 41.2
48.7 41 58.0 48.4 42 12.5 46.9 42 18.3 44.0 42.5 43 11.0 44.5 43 1.5
52.0 2.0 57.5 16.1 50.2 20.5 47.0 46.0 14.1 47.6 8.6
58.4 5.0 58.0 19.1 56.5 23.1 53.5 52.4 17.1 54.1 6.6
1.5 1.2 59.7 56.7 55.5 57.2
4.7 4.4 2.9 59.8 58.8 0.6

381 0 377 4 421 3 447 3 435 6 393 7
120 120 60 60
501 0 41 14.50 497 4 41 11.20 481 3 41 13.87 42 35.53 453 7 42 19.70
41 45.545 42 1.67 41 45.218 42 15.90 41 43.755 42 20.63 41 40.664 42 39.600 43 14.07 42 41.245 43 3.83
+51.76 +52.12 +53.61 +56.60 −×2.52 −×4.14
45.521 −26 45.194 −.37 43.731 −.42 40.640 −.50 39.576 −.45 41.221 −.48
42 36.97 42 36.965 42 36.90 42 36.8079 42 36.676 42 36.621
−51.45 −2.52 −51.776 −2.50 −53.17 −2.45 −56.185 −2.34 +2.912 −2.21 +4.601 −2.16
42 34.50 34.44 34.47 34.40 34.40 34.44

+ 51.71 + 52.1009 + 53.60 + 56.49 − 2.59 − 4.156 .44
− .34 − .35 − .42 − .38 − .38 − .49
− 2.52 +0.147 − 2.50 −0.127 − 2.465 −0.077 − 2.34 +0.033 − 2.21 +0.163 − 2.16 +0.213
+ 48.85 46 20.13 + 49.24 18.35 + 50.73 17.68 + 53.77 − 5.18 20.23 − 6.81 21.02
41 45.52 +10 15.68 41 45.19 +10 17.05 41 43.73 +10 18.19 41 40.64 +10 19.60 42 39.58 +10 17.67 42 41.22 +10 17.35
+.3 +.3 +.3 +.3 +.31 +.3
42 34.37 −1.70 42 34.43 −1.90 42 34.46 −2.60 42 34.41 42 34.40 −5.00 42 34.41 −5.40
36.743 49 56 34.41 36.803 56 33.80 36.833 56 33.57 36.783 36.773 56 33.20 36.783 56 32.97

+31.04 −16.13 +34.02 −30.68 +29.88 −36.88 + 4.07 − 34.47 +21.54 −22.59
35 −2.17 35 −2.14 35 −2.13 ~~−2.97~~ 35 −1.98 35 −1.92
1 7.5 1 46.6 1 4.4 1 58.9 1 10.1 2 5.9 A.K. 1 28.1 1 59.8 1 13.9 1 49.5
12.5 51.3 13.2 7.0 15.6 11.9 36.7 7.5 20.7 56.7
20.0 97.9 17.6 125.9 25.7 17.8 64.8 127.3 34.6 106.2
36 10.00 36 48.95 36 8.80 37 2.95 36 12.85 37 8.90 36 22.40 37 3.65 36 17.30 36 53.10

1.49192 1.20763n 1.53173 1.48686n 1.47538 1.56679n 0.60959 1.53744n 1.33325 1.35392
1.41057 1.12622n 1.45032 1.40545n 1.39005 1.48146n 0.52426 1.45211n 1.24792 1.26859
+25.74 −13.37 +28.21 −25.44 +24.55 −30.30 +3.34 −28.32 +17.70 −18.56
36 35.74 36 35.58 36 37.01 36 37.51 36 37.40 36 38.60 36 35.74 36 35.33 36 35.00 36 34.54

+49° 46 12.61 12.77 46 11.34 10.84 46 10.95 9.75 46 12.61 13.02 46 13.35 13.81
12.69 11.09 10.35 12.81 13.58
−7 34 7 33 28
0.88370n 0.88310n
−225 −561 −451 −1303 −1244
.88145 .88085 .87809 .87749 .87919 .87859 .87067 .87007 .87126 .87066
+7.61 +7.61 +7.55 +7.54 +7.57 +7.56 +7.42 +7.41 +7.43 +7.42

−.27 +.17 −.07 −.31 −.28 −.25 −.24 −.23 −.35 −.1 .00 −.31 −.12 +.02 −.13
.00 .00 .00 .00 +.05 +.08 +.13 +.19 +.12 +.17
+7.34 +7.54 +7.24 +7.29 +7.38 +7.29 +7.54 +7.29 +7.43 +7.46
46 19.95 20.31 18.58 18.13 18.33 19.04 20.15 20.31 20.78 21.20
56 35.5 35.7 36.4 38.8 38.2
+10 15.6 15.2 17.1 17.6 18.1 19.4 18.7 18.5 18.6 17.9
+10 15.4 17.3 18.7 18.6 18.2
+10 15.31 56 33.84 + 16.63 16.90 33.58 + 18.11 18.38 34.11 ~~+18.85~~ + 17.58 17.83 32.98 + 16.99 17.23 32.61
+ .28 15.59 −19.80 34.20 + .27 −20.00 33.13 + .27 −20.70 32.82 + + .25 −23.10 33.14 + .24 −23.50 33.10
− 1.70 − 1.90 − 2.60 − 5.00 − 5.40
+10 13.89 56 34.02 + 15.00 33.35 + 15.78 33.47 + 12.83 33.06 + 11.83 32.85
56 15.92 15.25 15.37 14.96 14.75

1875

May.	20	42^m 39.77^s		55'	73.3"	
	25	39.71	-.06		74.5	+1.2
	30	39.64	.07		75.5	1.0
June	4	39.57	.07		76.4	.9
	9	39.49	.08		77.3	.9
	14	39.40	.09		78.1	.8
	19	39.31	.09		78.8	.7
	24	39.21	.10		79.4	.6
	29	39.11	10		79.9	.5

A224^s
1875

× -.41 June 24 -.395 | × -.40 June 25 -.403 | × 1874 -.42 June 28 -.427 | -.52 May 27 -.510 | -.44 May 29 -.488 | -.50 June 8 -.486

42 24.7 42 18.3 42 25.0 42 11.8 42 26.5 42 18.1 42 13.8 41 57.8 42 17.8 42 3.4 42 18.6 42 9.0
27.9 21.7 28.1 13.8 29.7 20.7 17.0 59.8 21.0 5.9 22.0 12.0
31.0 24.3 31.3 16.1 33.0 23.6 20.2 3.1 24.3 8.5 25.1 14.5
37.4 37.7 39.2 26.7 30.7 31.5
40.6 41.0 42.4 29.9 33.8 34.7
43.7 44.2 45.6 33.0 37.0 38.0
46.9 43 5.7 47.4 43 5.9 48.8 43 12.4 36.2 42 49.5 40.2 43 0.7 41.2 43 3.9
50.3 9.6 50.6 8.8 52.1 15.3 39.5 52.5 43.6 3.2 44.2 6.8
56.6 12.4 56.9 11.7 58.6 18.4 45.7 55.3 49.9 6.4 50.7 9.4
59.9 0.2 1.7 49.0 52.9 53.9
3.1 3.4 5.0 52.2 56.2 57.1

4221 3658 3826 3632 4074 4170
60 120 120
4821 42 21.43 4858 42 13.90 5026 42 20.80 42 4.23 42 5.93 42 11.83
42 43.827 43 9.03 42 44.164 43 8.80 42 45.691 43 15.37 42 33.018 42 52.43 42 37.036 43 3.43 42 37.909 43 6.70
-6.84 -7.18 -8.78 +3.28 +2.13 +2.16
43.803 -49 44.140 -.48 45.667 -.50 33.994 -62 37.012 -52 37.885 -60
42 36.5049 42 36.48 42 36.421 42 39.68 42 39.65 42 39.520
+7.301 -2.04 +7.66 -2.03 +9.256 -1.96 -6.69 -2.86 -2.64 -2.83 -1.652 -2.68
42 3443 3445 3443 3679 3679 3676
- 6.87 - 7.18 - 8.75 + 3.29 + 3.11 + 2.12
- .47 - .48 - .51 - .61 - .58 - .58
- 2.04 +0.333 - 203 +0.343 - 1.96 +0.413 - 2.86 - 283 - 268
- 9.38 46 2042 - 9.69 - 11.22 46 1899 - 0.18 12 1957 - 0.30 2062 - 1.14 2308
42 43.80 +10 1910 42 44.14 42 45.67 +10 2013 42 36.99 -16 359 42 37.01 -16 498 42 37.88 -16 559
+.4 +.3 +.4 +.2 +.2 +.3
42 34.42 -610 42 34.45 42 34.45 -650 42 36.81 +070 42 36.71 +040 42 36.74 -150
36.793 56 33.82 36.823 +49 36.823 56 33.02 56 16.88 56 16.24 56 16.29

+22.40 -25.20 +30.26 -24.64 +24.89 -29.68 +32.79 -19.41 +31.11 -26.39 +26.08 -28.79
35 35 35 5 5 5
-1.78 -1.67 -2.07 -2.06 -1.96
1 12.4 1 51.8 1 5.0 1 50.5 1 10.0 1 54.2 4 54.1 0 40.4 4 56.9 0 44.9 4 57.5 0 44.0
22.0 0.7 15.1 0.0 23.5 6.9 20.2 6.8 20.5 9.8 23.2 10.3
.344 1125 20.1 1105 335 121 1343 1072 1374 1147 1407 1143
36 17.20" 36 56.25 36 10.05 36 55.25 36 16.75 37 0.55 (10) 7.15 10 53.60 10 8.70 10 57.35 10 10.35 10 57.15

1.35025 1.40140 n1.48087 1.39164 n1.39602 1.47246 n1.51574 1.28803 1.49290 1.42144 n1.41631 1.45924n
1.36492 1.31607 n1.39554 1.30631 n1.31069 1.38713 n1.44993 1.22222 n1.42709 1.35563 n1.35050 1.39343n
+18.40 -20.71 +24.86 -20.25 +20.45 -24.39 +28.18 -16.68 +26.73 -22.68 +32.42 -24.74
36 35.60 36 35.54 36 34.91 36 35.00 36 37.20 36 36.16 10 35.33 10 36.92 10 35.43 10 34.67 10 32.77 10 32.41

46 12.75 12.81 46 13.44 13.35 46 11.15 12.19 12 13.02 11.43 12 12.92 13.68 12 15.58 15.94
12.78 .13.39 11.67 12.22 13.30 15.76
34 0 33 17 39 41 32 54
0.88360n 0.88300n 0.88330 0.88260n
-1191 -2876 -304 -105 -195
.87199 .87119 .85484 .85424 .88026 .87956 .88225 .88155 .88135 .88065
+7.44 +7.43 +7.43 +7.43 +7.16 +7.15 +7.59 +7.58 +7.62 +7.61 +7.61 +7.60
-.13 +.20 -.17 -.24 +.14 -.16 -.16 +.16 -.24 -.28 -.23 -.10 -.26 -.29 -.18 -.18 -.28 -.22
+.29 +.42 +.26 +.42 +.29 +.44 -.01 -.08 -.01 -.13 -.03 -.13
+7.60 +7.68 +7.29 +7.35 +7.30 +7.40 +7.35 +7.30 +7.40 +7.25
20.35 20.49 18.44 19.54 12 20.32 18.83 20.27 20.98 22.98 23.19
39.9 40.0 40.3 56 15.0 15.3 17.2
+10 17.6 19.4 21.9 20.8 -16 5.3 3.8 5.0 5.7 5.8 6.0
+10 19.5 21.4 -16 4.5 5.3 5.9
+10 19.00 19.23 33.48 + 19.86 20.07 32.01 - 16 4.01 56 17.27 - 5.28 5.03 15.65 - 5.73 5.48 16.60
+ .23 -24.20 33.62 + .21 -24.70 33.11 + .26 3.75 15.78 + .26 16.36 + .25 16.21
- 6.10 - 6.50 + 0.70 + 0.40 - 1.50
+10 13.13 33.55 + 13.51 32.51 - 16 3.05 56 16.52 - 4.62 16.00 - 6.98 16.10
15.45 14.41

1874.0 α	δ	1875.0 α	δ
34.37		36.81	
.43		71	
46		74	
41		84	
40		85	
41		76	
42		76	
45			
45			
34.422		36.783	
.452	3380	.825	15.70
−.030		−.042	

7.45
June 14
.440

42 — 42 1.4
— 42
— 7.2
31.8
34.9
38.3
41.4
44.8
—
—
—

1912

42 38.240 42 4.27
+1.70
−.84
38.216
42 39.4038
−1.186 −2.56
36.83
+ 1.70
− .52
− 2.56
− 1.38 2564
42 38.22 −16 714
+.3
42 36.84 −240
56 16.40

+33.97
5
−1.91
4 47.5
14.0
121.5
10 0.75

1.53110
1.46539
+29.19
10 29.94

12 18.41

−616
.87714 .87644
+7.54 +7.52

−.31 ~~−.16~~ −.31
.00
+7.23
2564
181
75
70
−16− 7.28 7.04
+ .24
− 2.40
− 9.44 16.20

7.44
June 15
.453

42 — 42 3.9
— 6.7
— 8.9
32.1
35.3
38.4
41.7
45.0
—
—
—

1925

42 38.500 42 6.50
+1.45
−.52
38.476
42 39.386
−~~.890~~ 0.88 −2.54
3687
+ 1.45
− .54
− 2.54
− 1.63 2553
42 38.48 −16 735
+.3
42 36.85 −260
56 15.88

+32.50
5
−1.88
4 49.7
15.3
12.50
10 2.50

1.50515
1.43934
+27.50
10 30.00

12 18.35

−1094
.87236 .87166
+7.45 +7.44

−.27 ~~−.13~~ −.27
.00
+7.18
2558
183
72
72
− 6.72 6.48
+ .24
− 2.60
− 9.08 16.45

7.51
June 20
.508

42 20.2 42 7.3
23.4 9.8
26.5 12.7
32.9
36.2
39.5
42.6 43 2.3
45.8 4.7
52.2 7.2
55.5
58.5

4333

42 39.391 42 9.93
43 4.73
+0.54
39.367 −.61
42 39.29
+0.08 −2.47
3683
+ 0.46
− .60
− 2.47
− 2.61 2558
42 39.37 −16 638
+.3
42 36.76 −330
56 16.20

+29.46 −25.34
5
−1.89
4 51.7 0 37.5
18.2 5.3
1299 1028
10 4.95 10 51.40

1.46923 1.40381
1.40342 1.33800
+25.32 −21.78
10 30.27 10 29.62

12 18.08 18.73
18.40
33 43 32 57
0.88330 0.88260
−976
.87354 .87284
+7.47 +7.46

−.23 −.29 .17
−.02 −.16
+7.22 +7.13
2530 2586
190
63 6.9
66
− 6.70 6.46 15.54
+ .24 16.10
− 3.30
− 9.76 15.82

7.62
June 24
.647

42 20.6 42 10.2
23.7 13.1
26.9 15.8
33.4
36.4
39.7
43.0
46.1
52.6
55.8
59.0

4372

42 39.745 42 13.03
+0.15
−.74
39.721
42 39.270
+0.52 −2.38
3676
+ 0.19
− .77
− 2.38
− 2.96 2575
42 39.72 −16 644
+.4
42 36.76 −370
56 16.01

+26.71
5
−1.91
4 53.1
20.2
1333
10 6.65

1.42667
1.36086
+32.96
10 29.61

12 18.74

−2483
.85847 .85777
+7.22 +7.21

−.19 ~~−.10~~ −.21
−.02
+7.01
2575
194
6.3
6.3
−6.70 6.46
+ .24
− 3.70
− 10.16 15.59

8

10 i Draconis
13h 47m 47sec.
+65° 21′
− −22° 58
sin z = −.39
corr α = −.066s
corr δ = +.31″
tang δ = +2.17
I = 4.93s
K = −.036s

1874
May. 20 47m 49.10s | 20′ 48.0″
25 48.98 −.12 | 49.2 +1.2
30 48.85 .13 | 50.3 1.1
June 4 48.71 .14 | 51.3 1.0
9 48.55 .16 | 52.2 .9
14 48.38 .17 | 53.0 .8
19 48.21 .17 | 53.6 .6
24 48.02 .19 | 54.1 .5
29 47.83 .19 | 54.6 .5

1874
α 45.222s
δ +20′ 45.74″
+1.758s
−17.891
l cos δ 9.62021
l b .10992
l b′ 9.73013
l b′ 9.72621
l sin δ 9.95850

1875
46.980
+20 27.85
+1.758
−17.890
9.62021
.12552
9.74573

1874

X −22 May 27 −283
X −31 May 28 −297
X −35 June 1 −355
X −38 June 15 −317
X −40 June 18 −410
X −41 June 24 −395

13 46 47.6 46 19.2 46 47.5 46 9.9 46 46.0 46 27.8 47 41.7 47 33.3 47 43.2 47 15.5 47 45.9 47 17.9
50.1 24.0 49.9 15.6 48.3 33.0 44.1 37.4 45.8 19.4 48.3 23.1
52.6 28.5 52.5 19.9 51.0 28.0 46.5 43.2 48.3 23.3 50.9 26.3
55.2 54.8 53.4 48.9 50.6 53.4
57.4 57.3 55.9 51.4 53.1 55.7
0.0 59.8 58.5 54.1 55.7 58.1
2.6 47 14.1 2.2 47 1.4 0.9 56.7 48 6.6 58.2 48 6.0 0.7
4.9 4.8 6.2 3.3 59.0 9.8 0.8 7.0 3.1
7.5 7.2 10.3 5.7 1.4 14.2 3.2 5.6

2779 3360 3230 4038 3589 3217
240 180 180 60 120 180
5179 46 23.90 5160 46 15.13 5030 46 32.93 4638 47 38.63 4789 47 19.40 5017 47 ~~22.43~~ ~~22.47~~
46 57.544 47 14.10 46 57.333 47 5.97 46 55.889 47 51.533 48 9.87 47 53.211 48 6.50 47 55.744

+51.77 +52.12 +53.61 −2.52 −4.14 −6.84
57.508 −.48 57.297 −.67 55.853 −.76 51.497 −.82 53.175 −.87 55.708 −.89
47 48.942 47 48.9489 47 48.8079 47 48.3634 47 48.254 47 48.081
−51.481 45 −3.70 −51.6459 −3.67 −52.954 −3.57 +3.146 −3.12 +4.923 −8.02 +7.6870 −27.9
−51.34 47 45.16 −51.52 45.08 −52.87 45.13 +3.23 45.04 +5.00 45.14 5 .15 +7.77 45.19

+ 51.71 + 52.10 + 53.60 − 2.59 − 4.156 − 6.87
− .61 − .64 − .77 − .69 − .89 − .86
− 3.70 −1.942 10 3545 − 3.67 −1.912 3295 − 3.527 −1.812 3473 − 3.12 −1.362 3550 − 3.02 −1.262 3895 − 2.79 −1.032 3515
+ 47.40 +10 1568 + 47.79 +10 1705 + 49.26 +10 1819 − 6.40 +10 1767 − 8.07 +10 1705 − 10.52 +10 1970
46 57.51 +.7 46 57.30 +.8 46 55.85 +.9 47 51.50 +.8 47 53.17 +.8 47 55.71 +.8
−400 −420 −510 −750 −780 −840
47 44.91 65 20 48.03 47 45.09 20 46.60 47 45.11 20 48.73 47 45.10 20 46.47 47 45.10 20 49.00 47 45.19 20 46.65
46.668 46.848 46.868 46.858 46.858 46.948 31

+33.64 −16.56 +42.20 −8.64 +22.96 +12.90 −18.34 +28.13 −18.97 +33.27
10 10 10 10 10 10
−2.17 −2.14 −2.13 −1.98 −1.92 −1.78
2 18.3 2 45.2 2 13.1 2 40.9 2 20.3 2 27.0 2 43.9 2 15.5 2 41.3 2 16.0
20.0 46.3 19.9 47.2 30.8 31.7 50.0 20.9 45.4 23.0
383 915 330 881 511 587 939 364 867 390
12 19.15 12 45.75 12 16.50 12 44.05 12 25.55 12 29.35 12 46.95 12 18.20 12 43.35 12 19.50

1.52686 1.21906n 1.62531 0.93651 1.36097 1.11059 1.26340 1.44917 1.27807n 1.62257
1.25699 0.94919n 1.35544 0.66664n 1.08718 0.83680 0.98961n 1.17538 1.00428n 1.24848
+18.07 −8.90 +22.67 −4.64 +12.22 +6.87 −9.76 +14.98 −10.10 +17.73
12 37.22 12 36.85 12 39.17 12 39.41 12 37.77 12 36.22 12 37.19 12 38.18 12 33.35 12 37.23
+65°
20 11.13″ 11.50 20 9.18 8.94 20 10.58 20 12.13 11.16 20 15.17 15.10 11.12
11.31 9.06 11.64 15.13

22 57 58 57 31
1.38740n 1.38720n
−210 −549 −435 −1303 −1236 −1174
1.38530 1.38510 1.38181 1.38171 1.38305 1.38285 1.37437 1.37417 1.37504 1.37484 1.37566 1.37546
+24.28 +24.27 +24.09 +24.08 +24.16 +24.15 +23.68 +23.67 +23.72 +23.71 +23.75 +23.74

−.23 −.14 −.05 −.37 −.19 −.2 −.11 −.00 −.03 +.18 −.07 −.16 +.10 −.08 −.23 +.14
.00 .00 .00 −.00 +.10 −.01 +.22 +.25 +.21 +.24 +.51 +.28
+24.05 +24.22 +23.72 +24.06 +24.15 +23.87 +23.85 +23.77 +23.87 +24.03
10 38.78 38.02 32.90 33.00 34.78 36.00 35.01 38.94 38.97 38.75
20 49.7 49.9 50.8 53.2 53.5 54.1
+10 14.5 14.0 17.0 16.9 16.1 17.2 18.2 14.6 14.5 19.0
+10 14.3 17.0 16.1 17.7 14.6 19.0
+16 14.6 47.33 17.3 46.16 16.4 18.0 46.85 14.9 48.87 19.3
+10 15.31 16.15 47.87 + 16.63 17.46 46.26 + 18.11 18.94 + 17.58 18.25 45.86 + 16.99 17.73 48.90 + 19.00 19.69
+ .84 −21.89 + .83 −23.09 + .83 −22.99 + .77 −25.39 + .74 −25.69 + .69 −26.29
− 4.00 20 47.60 − 4.20 46.21 − 5.10 48.57 − 7.50 46.35 − 7.80 48.88 − 8.40 46.44
+10 12.15 20 29.71 + 13.26 28.32 + 13.84 30.68 + 10.85 28.46 + 9.93 30.99 + 11.24 28.55

1875

May	20	47 m 51 s.21		20'	27".6	
	25	51.09	-.12		28.8	+1.2
	30	50.96	.13		29.9	1.1
June	4	50.82	.14		30.9	1.0
	9	50.66	.16		31.8	.9
	14	50.49	.17		32.6	.8
	19	50.32	.17		33.3	.7
	24	50.13	.19		33.9	.6
	29	49.93	.20		34.3	.4

X 1874 — 1875

-.42 June 28 -.427 — -.44 May 29 -.488 — -.50 June 8 -.485 — -.51 June 20 -.508 — -.62 June 24 -.647

47 47.7 47 24.8 47 38.8 47 9.7 47 39.9 46 38.3 47 41.0 47 32.3 47 41.4 47 11.1
50.1 28.1 41.3 11.7 42.3 41.6 43.4 44.0 14.6
52.6 33.2 43.9 16.3 44.7 45.0 46.0 46.5 19.2
55.0 46.3 47.1 48.4 48.8
57.6 48.5 49.5 50.8 51.3
0.1 51.2 52.0 53.3 48 8.3 53.8
2.6 48 6.7 53.6 54.3 49 2.0 55.7 12.1 56.3
5.0 11.1 56.2 57.0 30.5 58.1 16.7 58.8
7.7 15.7 58.8 59.4 36.1 0.6 1.3

2784 4384 4462 3973 4022
240 60 60
5184 47 28.70 47 12.57 46 41.63 4573 47 32.30 4622 47 14.97
47 57600 48 11.17 47 48.711 47 49.578 47 31.20 47 50.811 48 12.37 47 51.356

-8.78 +2.14 (3) +2.16 +0.53 +0.16
57.564 -.91 48.675 -.95 49.542 -1.09 50.775 -1.11 51.320 -1.35
47 47.886 47 51.00 50.98 47 50.7069 47 50.29 28 47 50.142
+9.6870 -2.64 -2.321 -4.00 -1.167 -3.71 +0.489 -3.30 +1.1820 -3.14
+9.77 4523 -2.24 4687 .87 -1.10 4690 +0.56 4690 +1.27 4699

- 8.76 + 3.11 + 2.12 + 0.46 + 0.19
- 1.93 - 1.06 - 1.05 - 1.10 - 1.40
- 2.64 -0882 10 3459 - 4.00 36 3410 - 3.71 3609 - 3.30 3946 - 3.14 3599
- 12.33 +10 2013 - 1.95 -16 498 - 2.64 -16 559 - 3.94 -16 638 - 4.35 -16 644
47 57.56 +8 47 48.67 +9 47 49.54 +9 47 50.77 +10 47 51.32 +9
-880 -190 -390 -570 -610
47 45.23 20 4072 47 46.72 20 2812 47 46.90 20 27.50 47 46.83 20 2838 47 46.97 20 2435
46.988 ~~2802~~

+28.90 -13.57 +35.14 (6) +67.95 +18.38 +18.51 -21.56 +36.39
10 45 45 45 45
1 -1.67 -2.06 -1.96 -1.89 -1.91
2 15.9 2 39.2 1 7.4 0 45.0 1 14.6 1 9.9 1 32.1 0 6.3
26.4 50.4 28.5 9.0 38.7 34.8 55.9 23.0
, 42.3 89.6 35.9 11.40 53.3 44.7 88.0 29.3
12 21.15 12 44.80 46 17.95 45 57.00 46 26.65 46 22.35 46 44.00 45 14.65 (146)

1.46090 1.13258 1.55799 1.83219 1.26435 1.26741 1.33865 1.56098
1.18711 0.85879 1.30372 1.57792 1.01008 1.01314 1.07938 1.30671
+10.39 -7.22 +20.13 +37.84 +10.24 +10.31 -12.01 +20.26
12 36.54 12 37.58 46 38.08 46 34.84 46 36.89 46 32.66 46 31.99 46 34.91

20 11.81 10.77 36 10.27 36 13.51 11.46 36 15.69 16.36 37 13.44
11.29 12.48 16.02
57 56 57 32 57 30 57 51 57 21 57 26 57 4 57 33
1.38740 n 1.38720 n 1.38720 n 1.38730 n 1.38720 n 1.38720 n 1.38700 n 1.38720 n
-2855 -187 -173 -1062 -2467
1.35885 1.35865 1.38533 1.38557 1.38548 1.37658 1.37638 1.36253
+22.85 +22.84 +24.28 +24.30 +24.29 +23.80 +23.79 +23.04

-.16 +.45 -.03 -.27 ~~-.27~~ -.45 -.97 -.68 -.07 -.07 -.36 -.09 -.27 ~~-.24~~ .44
+.51 +.59 -.18 -.13 -.20 -.25 -.31 -.22
+23.20 +23.40 +23.83 +23.20 +24.02 +23.48 +23.39 +22.55
35.01 34.17 36 34.10 36.71 35.48 39.17 39.75 35.99
54.5 29.7 31.7 33.5 33.9
19.5 20.3 -16 4.4 5.0 8.8 5.7 6.2 2.1
19.9 -16 4.4 4.9 6.0 2.1
20.2 4672 -16 4.1 4.1 2784 5.7 2750 1.8
+10 19.86 20.51 4558 -16 5.28 4.48 -5.73 4.97 26.61 -6.70 5.97 28.08 -6.70 5.96
+ .65 -26.69 + .80 + .76 + .73 + .74
- 8.80 4630 - 1.90 20 27.12 - 3.90 27.22 - 5.70 27.79 - 6.10 23.73
+ 11.71 2841 -16 6.38 - 8.87 - 11.67 - 12.06

η Bootis ☾

h m sec
13 48 44

+19° 2'

ζ = +23° 21'
ζ sin ζ = +39

1874

May. 20	48ᵐ	42.90ˢ		1'	41.7"	
25		42.88	−.02		42.4	+.7
30		42.86	.02		43.1	.7
June 4		42.84	.02		43.8	.7
9		42.81	.03		44.4	.6
14		42.78	.03		45.0	.6
19		42.74	.04		45.6	.6
24		42.70	.04		46.1	.5
29		42.65	.05		46.6	.5

1874
α 41.098ˢ
δ +1' 48.46"
dα/dτ +2.857ˢ
dδ/dτ −18.206"

l cos δ 9.97558
l b .10992
l b' .08550

l b' .08158

l sin δ 9.51338

1875

cons =
cons δ =

long δ = +.34
I = .218ˢ
k = −.016ˢ

× 1874 −.22 May 27 −.283				× −.31 May 28 −.297				× −.35 June 1 −.355				× .42 June 8 −.324		× −.41 June 24 −.395				× −.42 June 28 −.427			
13 47	38.2	47	45.7	47	37.8	47	37.2	47	36.2	47	40.0	47	33.2	48	36.7	48	30.3	48	38.5	48	40.2
	40.3				39.9		39.0		38.5		42.1		35.3		38.8		31.9		40.7		42.1
	42.6				42.1		41.1		40.8		44.3		37.8		41.0		33.6		42.9		44.0
	46.9				46.5				45.0				42.1		45.4				47.3		
	49.0				48.7				47.1				44.3		47.5				49.5		
	51.3				51.0				49.3				46.4		49.7				51.6		
	53.4	48	12.6		53.1	48	12.0		51.5	48	7.7		48.5		51.8	49	10.9		53.7	49	29.9
	55.6		14.7		55.2		14.5		58.8		10.0		50.9		54.1		12.6		55.9		31.9
	0.0		16.7		59.6		16.9		58.1		12.9		53.0		58.4		14.6		0.3		33.6
	2.1				1.9				0.2				57.1		0.6				2.4		
	4.3				4.0				2.5				59.6		2.8				4.6		

3837 4398 4230 5102 4268 3874
180 120 120 120 180

5637 47 45.70 5598 47 39.10 5430 47 42.13 5468 48 31.93 5674 48 42.10
47 51.245 48 14.67 47 50.891 48 14.47 47 49.364 48 10.20 47 46.382 48 49.709 49 12.70 48 51.582 49 31.80
+51.77 +52.12 +58.61 +56.60 −6.84 −8.78
51.229 −.07 50.875 −.11 49.348 −.12 46.366 −.14 49.693 −.14 51.566 −.14
48 42.87 48 42.87 48 42.85 48 42.82 48 42.70 48 42.66
−51.64 −1.77 −58.00 −1.77 −53.50 −1.75 −56.45 −1.72 +6.99 −1.60 +8.91 −1.56
48 41.16 41.12 41.09 41.11 41.11 41.09

+ 51.71 + 52.10 + 53.60 + 56.49 − 6.84 − 8.76
− .10 − .10 − .12 − .11 − .13 − .14
− 1.77 +1.087 − 1.77 +1.087 − 1.75 +1.107 − 1.72 +1.137 − 1.60 +1.257 − 1.56 +1.297
+ 49.84 51 27.94 + 50.23 26.86 + 51.73 25.25 + 54.66 − 8.60 27.24 − 10.46 25.71
47 51.23 +10 15.68 47 50.87 +10 17.05 47 49.35 +10 18.19 47 46.37 +10 19.60 48 49.69 +10 19.10 48 51.57 +10 20.13
−.8 −.8 −.8 −.8 −.7 −.7
48 41.07 +5.80 48 41.10 +5.60 48 41.08 +5.10 48 41.03 48 41.09 +2.40 48 41.11 +2.00
43.927 19 1 48.62 43.957 1 48.71 43.937 1 47.74 43.887 43.947 1 48.04 43.967 1 47.14

+ 5.54 − 23.43 + 11.79 − 23.58 + 7.23 − 20.84 + 17.78 − 22.99 + 9.48 − 40.22
30 30 30 30

A. R.

1 −2.17 −2.14 −2.13 30 −1.78 −1.67
0 42.9 1 18.5 0 34.5 1 18.0 0 43.0 1 17.0 0 28.0 1 16.7 0 38.5 1 37.9
55.3 29.4 49.9 33.9 57.2 29.8 43.2 33.0 58.0 57.8
98.2 47.9 84.4 51.9 100.2 46.8 71.2 49.7 96.5 95.7
30 49.10 31 23.95 30 42.20 31 25.95 30 50.10 31 23.40 30 35.60 31 24.85 30 48.25 31 47.85

0.74351 1.36977ₙ 1.07151 1.37254ₙ 0.85914 1.31890ₙ 1.24993 1.36154ₙ 0.97681 1.60444ₙ
0.82901 1.45537ₙ 1.15701 1.45804ₙ 0.94072 1.40048ₙ 1.33151 1.44312ₙ 1.05839 1.68602ₙ
+ 6.74 − 28.53 + 14.36 − 28.71 + 8.72 − 25.15 + 21.45 − 27.74 + 11.44 − 48.53
30 55.84 55.42 30 56.56 57.24 30 58.82 58.25 30 57.05 57.11 30 59.69 59.32

51 52.51 52.93 51 51.79 51.11 51 49.53 50.10 51 51.30 51.24 51 48.66 49.03
52.72 51.45 49.81 51.27 48.84

+23 20 32 21 7 20 31 21 31
1.39520 1.39540 1.39520 1.39560
−206 −545 −431 −1169 −2857
1.39314 1.39334 1.38975 1.38995 1.39089 1.39109 1.38351 1.38371 1.36669 1.36709
−24.73 −24.74 −24.53 −24.55 −24.54 −24.61 −24.18 −24.19 −23.26 −23.29

− 1 −.04 −.08 −.02 −.05 −.08 −.03 − 1 −.06 .00 −.05 +.16 −.08 − 2 +.14 −.27
.00 .00 .00 .00 +.03 +.06 +.13 +.31 +.18 +.40
− 24.74 − 24.82 − 24.55 − 24.63 − 24.52 − 24.61 − 24.10 − 23.96 − 23.10 − 23.16
57 27.77 28.11 27.24 26.48 25.01 25.49 27.20 27.28 25.56 25.80
1 42.7 42.9 43.4 46.1 46.5
+10 14.9 14.6 15.9 16.4 18.4 17.9 18.9 18.8 20.9 20.6
+10 14.75 16.0 18.2 18.9 20.7
+10 15.31 14.47 48.98 + 16.63 15.80 48.67 + 18.11 17.28 47.42 + 19.00 18.31 47.91 + 19.86 19.21 46.77
− .84 −12.40 48.92 − .83 −12.60 47.91 − .83 −13.10 47.90 − .69 −15.80 47.99 − .65 −16.20 47.09
+ 5.80 + 5.60 + 5.10 + 2.40 + 2.00
+10 20.31 1 48.25 + 21.43 48.29 + 22.41 47.66 + 20.71 47.75 + 21.21 46.93
1 30.04 30.08 29.45 29.75 28.72

1875

		h	s		°	'	"	
May	20	48	46.08		1		21.1	
	25		46.07	-.01			21.9	+8
	30		46.05	.02			22.6	.7
June	4		46.03	.02			23.3	.7
	9		46.00	.03			23.9	.6
	14		45.97	.03			24.5	.6
	19		45.93	.04			25.1	.6
	24		45.88	.05			25.6	.5
	29		45.83	.05			26.1	.5

1875 s

α 43.955

δ +1° 30.25

dα/dT +2.857

dδ/dT -18.204

b cos δ 9.97558

bb .12552

bb .10110

1874.0 α	δ	1875.0 α	δ
41.07		43.95	
10		94	
08		90	
03		98	
09			
11			
41.080		43.943	
.098	48.46	.955	30.25
-.018		-.012	

1875

-.44 May 29 -.488 | 7.50 June 8 7.485 | 7.51 June 20 7.508 | 7.62 June 24 7.647

48 30.0 48 23.0 48 31.0 48 21.3 48 — 48 55.4 48 33.0 48 24.4

32.2 25.3 33.0 23.1 — 35.0 26.1

34.5 27.0 35.4 25.2 — 37.3 28.0

38.9 39.7 41.2 41.6

41.0 41.9 43.4 43.8

43.2 44.1 45.6 46.0

45.3 49 1.1 46.3 49 0.7 47.8 48.0 49 4.9

47.4 3.1 48.4 2.5 50.0 50.3 7.3

51.8 4.9 52.8 4.4 — 54.1 9.5

54.0 54.9 — 56.8

56.2 57.1 — 59.0

47.43 48 25.10 48.46 48 23.20 48 55.40 50.55 48 26.57

48 43.118 49 3.03 48 44.055 49 2.53 45.60 48 45.955 49 7.23

+3.14 +2.16 +0.53 +0.16

43.102 -.15 44.034 -.17 45.58 -.17 45.959 -.21

48 46.05 48 46.01 48 45.92 48 45.88

-2.95 -2.10 -1.97 -2.06 -0.34 -1.97 +0.06 -1.93

43.99 43.97 43.97 43.96

+ 3.11 + 2.12 + 0.46 + 0.19

- .16 - .16 - .17 - .22

- 2.10 - 2.06 - 1.97 - 1.93

+ 0.85 17 28.73 - 0.10 31.34 - 1.68 32.19 - 1.96 32.58

48 43.10 +16 4.98 48 44.04 -16 5.59 48 45.58 -16 6.38 48 45.94 -16 6.44

-1.0 -.9 -1.0 -.9

48 43.95 +7.70 48 43.94 +6.40 48 43.90 +5.00 48 43.98 +4.60

1 30.45 1 30.25 1 29.81 1 29.84

s

+18.02 -19.91 +20.85 -18.48 -9.80 +19.78 -21.28

0 0 0 0

1 -2.06 -1.96 -1.89 -1.91

4 22.0 0 9.7 4 16.6 0 5.5 4 52.9 4 15.7 0 ~~7~~6.9 69

41.2 29.8 37.0 26.4 14.6 37.9 ~~30~~.5 30.5

63.2 39.5 53.6 31.9 12.75 53.6 ~~32.4~~

4 31.60 5 19.75 4 26.80 5 15.95 5 3.75 4 26.80 5 ~~16.20~~ 18.70

1.25575 1.29907n 1.31911 1.26670n 0.99123n 1.29623 1.32797n

1.35685 1.40017n 1.42021 1.36780n 1.09233n 1.39733 1.42907n

+22.74 -25.13 +26.33 -23.32 -12.37 +24.96 -26.86

4 54.34 4 54.62 4 53.12 4 52.63 4 51.38 4 51.76 4 ~~49.34~~ 51.84

17 54.01 53.73 17 55.23 55.72 17 56.97 17 56.59 ~~59.01~~

53.87 55.47 56.55 56.51

20 44 21 32 20 39 21 31

1.39530 1.39560 1.39530 1.39560

-184 -170 -2464

1.39346 1.39376 1.39360 1.39390 1.37066 1.37096

-24.74 -24.76 -24.75 -24.74 24.74 -23.48 -23.49

-.05 -.38 -.05 -.06 -.38 -.05 - .2 ~~-.02~~ -.05 -.48 -.07

-.63 -.04 -.62 -.04 -.02 -.04 -.79 -.05

-25.42 -24.85 -25.43 -24.83 - 24.78 - 24.32 -23.61

17 28.59 28.88 29.80 30.85 32.19 32.27 32.90

1 22.5 23.8 25.2 25.6

-16 6.1 6.4 6.0 7.1 7.0 6.7 7.3

-16 6.3 6.5 7.0

-16 5.28 6.08 30.21 - 5.73 6.49 29.71 - 6.70 7.43 - 6.70 7.44 29.43

- .80 30.50 - .76 30.80 - .73 - .74 30.06

+ 7.70 + 6.40 + 5.00 + 4.60

-15 58.38 1 30.35 - 0.09 30.25 - 2.43 29.76 - 2.84 29.74

9 Bootis
h m sec.
13 50 51
+ ~~26~~ 28° 6'
Z = + 12° 17'
J sin z = +.25

1874
α
δ
$\frac{d\alpha}{dt}$
$\frac{d\delta}{dt}$
ℓ cos δ ~~9.95329~~ 9.94553
ℓb .10992
ℓb' ~~.06321~~ .05545
ℓb' ~~.05959~~ .05153
ℓ sin δ ~~9.64339~~ 9.67303

1875
50 51.73
6 ~~4.28~~ 20.48
+2.743
− 17.80
9.94553
~~9.95329~~
.12562
~~.07881~~
.07105

corr α =
corr δ =
ℓ tang δ = +.53
I = 2.34 s
k = −.018 s

1874

	May 27		May 28		June 1		June 15		June 18		June 24	
	−.283		−.297		−.355		−.317		−.410		−.395	
13	49 45.3 47.5 49.9 54.6 56.9 59.2 1.5 8.9 8.6 11.0 13.2	49 42.1 44.1 45.7 50 16.8 19.5 21.8	49 44.9 47.3 48.6 54.3 56.5 59.0 1.3 3.6 8.3 10.7 13.0	49 31.5 33.7 35.7 50 11.9 13.9 15.7	49 43.4 45.8 48.1 52.7 55.2 57.4 59.8 2.3 6.8 9.2 11.4	49 31.9 34.1 36.2 50 11.9 14.1 16.1	50 39.5 41.9 44.3 48.8 51.1 53.4 56.8 58.2 2.8 5.2 7.5	50 43.8 45.8 48.0 51 21.3 23.3 25.2	50 41.1 42.6 45.5 50.4 52.8 55.1 57.5 59.7 4.3 6.8 9.2	50 40.6 51 13.2 14.7 16.3	50 ~~43.4~~ 46.0 48.4 53.0 55.4 57.7 0 1 2.5 7.1 9.4 11.7	50 39.1 41.7 43.4 51 21.2 23.7 25.7
	3516 300 6516 49 59.236 59.218	49 43.97 50 19.37	3485 300 6485 49 58.955 58.937	49 33.63 50 13.83	3921 ~~3821~~ 240 6321 49 ~~56.555~~ 57.464 57.446	49 34.07 50 14.03	4085 180 5885 50 53.500 53.482	50 45.87 51 23.27	4262 180 6062 50 55.109 55.091	50 40.60 51 14.73	3350 300 6350 50 57.727 57.709	50 41.40 51 23.53
	+ 51.71 − .15 − 1.89 +0.853 + 49.67 49 59.22		+ 52.10 − .16 − 1.89 +0.853 + 50.05 49 58.94		+ 53.60 − .19 − 1.87 +0.873 + 51.54 49 57.45		− 2.59 − .17 − 1.76 +0.983 − 4.52 50 53.48		− 4.19 6 − .22 − 1.74 +1.003 − 6.12 50 55.09		− 6.47 .87 − .21 − 1.68 +1.063 − 8.76 50 57.71	
	50 48.89 51.633		50 48.99 51.733		50 48.99 51.733		50 48.96 51.703		50 48.97 51.713		50 48.95 48.958	51.693
	+15.27 25	−20.13	+25.32 25	−14.88	+23.39 ~~+22.46~~ 25	−16.57 ~~−17.48~~	+7.63 25	−29.77	+14.51 25	−19.62	+16.33 25	−25.80
	−2.17 0 52.7 0.9 113.6 25' 56.80"	1 32.6 40.0 72.6 26 36.30	−2.14 0 40.8 52.7 93.5 25 46.75	+ ~~25.8~~ 37.7 63.5 26 31.75	−2.13 0 44.9 54.7 99.6 25 49.80	1 31.1 39.9 71.0 26 35.50	−1.98 0 59.8 9.1 128.9 26 4.45	1 42.1 52.9 95.0 26 47.50	−1.92 0 52.1 61.1 113.2 25 56.60	1 29.9 39.5 69.4 26 34.70	−1.78 0 48.9 59.7 108.6 25 54.30	1 36.9 48.2 85.1 26 42.55
	1.18384 1.23929 +17.35 26 14.15	1.30384n 1.35929n −22.87 26 13.43	1.40346 1.45891 +28.77 26 15.52	1.17260n 1.22805n −16.91 26 14.84	1.36903 1.42056 +26.34 26 16.14	1.21932n 1.27085n −18.66 26 16.84	0.88252 0.93405 +8.59 26 13.04	1.47378n 1.52531n −33.52 26 13.98	1.16167 1.21320 +16.34 26 12.94	1.29270n 1.34423 −22.09 26 12.61	1.21299 1.26452 +18.39 26 12.69	1.41162n 1.46315n −29.05 13.50
+27°	56' 34.20" 34.56	34.92	56 32.83 33.17	56 33.51	56 32.21 31.86	56 31.51	56 35.31 34.84	34.37	56 35.41 35.57	35.74	56 35.66 35.25	34.85
+ 14	15 40 1.16540 −198	16 19 1.16580									15 37 1.16540	16 26 1.16580
	1.16342 −14.57	1.16382 −14.58	−539 1.16001 −14.46	1.16091 −14.47	−423 1.16117 −14.49	1.16157 −14.51	−1303 1.15237 −14.20	1.15277 −14.22	−1227 1.15313 −14.23	1.15353 −14.24	−1160 1.15380 −14.25	1.15420 −14.26
	−.05 −.06 .00 −14.62	−.08 .00 −14.66	−.14 −.09 .00 −14.60	−.05 .00 −14.52	−.12 −.04 +.03 −14.58	−.06 +.06 −14.51	− +.02 +.10 −14.12	−.20 +.16 −14.26	−.06 +.04 +.08 −14.20	−.08 +.14 −14.18	−.05 +.19 +.20 −14.10	−.14 +.37 −14.63
+27	56 19.58 +10 15.31 − .54 +4.03	20.26 14.77 −13.77	56 18.23 + 16.63 − .53 +3.87	18.99 16.10 −13.93	56 17.63 +18.11 − .54 +3.23	17.00 17.57 −14.57	56 21.19 +17.58 − .49 +1.18	20.11 17.09 −16.62	56 21.21 +16.99 − .48 +0.81	21.56 16.51 −16.99	56 21.56 +19.00 − .45 +0.09	20.82 18.55 −17.71
	+10 18.80	6 38.38 39.06 6 38.42 6 20.92	+ 19.97	38.20 38.96 38.58 20.78	+ 20.80	38.43 37.80 38.12 20.32	+ 18.27	39.46 38.38 38.92 21.12	+ ~~16.66~~ 17.32	38.53 ~~37.87~~ 38.88 ~~38.22~~ 38.70 ~~38.04~~ 20.90 ~~20.24~~	+ 18.64	40.20 39.46 39.83 22.03

1875

	June 8				June 20				June 24		
	-48.5				-.508				-.647		
50	38.0	50	31.5	50	39.7	50	40.8	50	39.9	50	33.6
	40.3		33.7		42.0		42.6		42.2		35.4
	42.7		35.4		44.4		44.1		44.6		37.1
	47.3				48.9				49.2		
	49.6				51.2				51.6		
	51.9				53.6				54.0		
	54.4	51	13.5		55.9	51	6.8		56.3	51	5.1
	56.6		16.3		58.2		8.8		58.6		7.2
	1.3		17.9		2.9		11.0		3.2		9.6
	3.7				5.3				5.6		
	6.0				7.6				8.0		
	3918				4097				4132		
	180				180				180		
	5718	50	33.53		5897	50	42.50		5932	50	35.37
50	51.982	51	15.90	50	53.609	51	8.87	50	~~53.936~~	51	7.30
									53.927		
	51.964				53.591				53.909		
+	2.12			+	0.46			+	0.19		
−	.26			−	.27			−	.34		
−	2.17			−	2.07			−	2.02		
−	0.31			−	1.88			−	2.17		
50	51.96			50	53.59			50	53.91		
50	51.65			50	51.71			50	51.74		
									51.70		
	s										
	+18.45		−23.92		+11.11		−15.26		+18.56		−13.37
55				55				55			
	−1.86				−1.89				−1.91		
4	37.1	0	26.9	4	43.1	0	13.7	4	34.0	0	11.0
	59.8		49.9		8.1		38.2		58.1		37.2
	969		768		1112		519		921		482
59	48.45	0	38.40	59	55.60	0	25.95	59	46.05	0	24.10
	1.26600		1.37876n		1.04571		1.18355n		1.26858		1.12613n
	1.33705		1.44981n		1.11676		1.25460n		1.33963		1.19718n
	+21.73		−38.17		+13.08		−17.97		+2186		−15.75
0	10.18	0	10.23	0	8.68	0	7.98	0	7.91		8.35
22	3817		38.12	22	3967	22	40.37	22	4044		39.99
	38.14				.4002				40.21		
16	0	16	50					15	58	16	36
	1.16560		1.16600						1.16560		1.16590
	−160				−1038				−2457		
	1.16400		1.16440		1.15522		1.15582		1.14103		1.14133
	−14.59		−14.60		−14.30		−14.31		−13.84		−13.85
	−.08	−.47	−.12		−.03	−.51	−.05		−.08	−.52	−.03
	−.67		−.08		−.88		−.07		−.86		−.07
	−15.34		−14.80		−15.21		−14.43		−14.78		−13.95
22	22.83		23.32	22	24.46		25.94	22	25.66		26.14
−16	5.73		6.22		−6.70		7.17		−6.70		7.18
−	.49			−	.47			−	.48		
	+4.07				+2.51				+1.98		
−16	2.15	6	20.68	−	4.66		19.80	−	5.20		20.46
			21.17				21.28				20.84
		6	20.92				20.54				20.65

88

50 Cass. L.C.

h m sec
13 52 48
108° 11'
7½ 49
γ = − 65 48
γ sin z = −.91

	1874 ~~NA~~ P'	1875
α	52 42.888	52 47.871
δ	48 35.10 11 24.90	48 52.78
dα/dt	+ 4.982	+ 4.984
dδ/dt	+ 17.68	+ 17.67
l cos δ	9.49424n	9.49424n
l c	.10600	.12552
l c'	9.60024n	9.61976n
l sin δ	9.97775	

7.22

corr α =
corr δ =

tang δ = − 3.05
5
I = 6.60

k = +.048

1874 NA

		m	s		'	"	
May	29	52	39.44		48	28.3	
June	3		39.76	+ .32		27.7	−.6
	8		40.10	.34		27.2	.5
	13		40.45	.35		26.8	.4
	18		40.82	.37		26.6	.2
	23		41.20	.38		26.5	.1
	28		41.60	.40		26.4	+ .1
July	3		42.00	.40		26.6	+ .2
	8		42.41	.41		26.8	.2

1874 — June 1 (x, −.35, −.355); June 2 (−29, −.220); June 15 (−38, −.317); June 18 (−40, −.410); 1874 June 28 (−42, −.427); 1875 June 8 (−.50, −.485)

13 51 32.2 51 18.7 | 51 31.9 51 13.8 | 52 29.3 52 31.4 | 52 30.5 52 13.5 | 52 42.7 (36.1, 39.4) 52 6.1 | 52 28.7 52 25.8
35.2 22.4 | 34.9 21.4 | 32.6 | 34.0 | 45.8 12.4 | 31.6 27.6
38.3 27.0 | 38.1 27.1 | 35.4 | 37.2 | 49.0 18.0 | 35.4
41.7 | 41.7 | 38.8 | 40.5 | 52.5 | 38.4
44.9 | 44.9 | 42.1 | 43.6 | 55.6 | 41.7
48.2 | 48.0 | 45.3 | 47.1 | 58.7 | 45.0
51.2 52 8.9 | 51.5 51 48.5 | 49.0 53 41.5 | 50.6 53 0.4 | 2.1 53 9.5 | 48.4 53 21.8
54.8 | 54.9 | 52.1 42.7 | 53.7 5.0 | 13.4 | 51.8 25.9
58.1 | 58.1 | 55.2 43.6 | 57.3 11.6 | 17.3 | 55.0 31.0

40.46 51 22.70 | 40.40 51 20.77 | 37.98 52 31.40 | 39.45 52 13.50 | 44.19 52 12.17 | 37.60 52 26.70
51 44.956 52 8.90 | 51 44.889 51 48.50 | 52 42.200 53 42.60 | 52 43.833 53 5.67 | 52 49.100 53 13.40 | 52 41.778 53 26.23
+5.361 +1.07 | +5.408 + .88 | − 2.52 + 1.16 | − 4.15 + 1.22 | − 8.78 + 1.28 | + 2.17 + 1.53

+3.36 | +3.22 | + 2.35 | +2.10 | +1.33 | + 2.67
52m 52m 43.00 | 43.07 | ~~47.49~~ 43.19 | 43.00 | 42.93 | 48.15

45.004 | 44.937 | 42.248 | 43.881 | 49.148 | 41.826
39.641 +5.39 | 39.67 +5.27 | 40.586 +1.689 | 40.5278 +3.06 | 41.6056 7.59

+ 53.60 54.61 8.68 | + 53.98 54.74 11.89 | − 2.59 58.3 11 11.79 | − 4.196 19 12.32 | − 8.786 19.34 | + 2.12 27 13.94
+ 1.08 +10 18.19 | + .67 +10 15.82 | + .97 +10 17.69 | + 1.25 +10 17.05 | + 1.30 +10 20.13 | + 1.48 −16 3.59
+ 3.36 +8.342 +2.1 | + 3.22 +8.202 +2.1 | + 2.35 +7.332 +2.0 | + 2.10 +7.082 +2.0 | + 1.33 +6.312 +2.0 | + 2.67 + 2.1
+58.04 −6.90 | + 57.87 −7.30 | + 0.73 −8.40 | − 0.81 −8.50 | − 6.13 −8.70 | + 6.27 −5.40
51 45.00 108 11 22.08 | 51 44.94 22.51 | 52 42.25 23.06 | 52 43.88 22.87 | 52 49.15 22.77 | 52 41.83 311m 5.05
52 43.04 | 52 42.81 | 52 42.98 | 52 43.07 | 52 43.02 | 52 48.10 11m (?)
48.022 | 47.792 | 47.962 | 48.052 | 48.002

+ 22.29 (6) −23.94 | + 24.12 − 3.61 | + 10.80 − 0.40 (6) | + 30.33 − 21.84 | + 36.93 − 24.30 | + 15.08 − 44.45
20 | 20 | 20 | 20 | 20 | 55
− 2.13 | − 2.12 | − 1.98 | − 1.92 | − 1.67 | − 1.96
3 54.9 3 36.7 | 3 54.1 3 44.4 | 3 44.0 3 15.1 | 3 51.1 3 30.1 | 3 49.8 3 25.0 | 2 33.7 2 9.9
55.9 37.1 | 54.0 43.6 | 46.1 17.9 | 53.6 32.8 | 58.9 33.4 | 59.8 36.2
110.8 73.8 | 108.1 88.0 | 90.1 33.0 | 104.7 62.9 | 108.7 58.4 | 93.5 46.1
23 55.40 23 36.90 | 23 54.05 23 44.00 | 23 45.05 23 16.50 | 23 52.35 23 31.45 | 23 54.35 23 29.20 | 57 46.75 57 22.05

1.35526 1.37912n | 1.38238 0.65751n | 1.03342 1.78104n | 1.48187 1.33925n | 1.56738 1.38561n | 1.17840 1.64787n
0.95550n 0.97936 | 0.98262n 0.15775 | 0.63366n 1.38128 | 1.08211 0.93949 | 1.16762n 0.98585 | 0.79816n 1.26763
− 9.03 + 9.54 | − 9.61 + 1.44 | − 4.30 + 24.06 | − ~~12.07~~ 13.06 + 8.70 | − 14.71 + 9.68 | − 6.28 + 18.52
23 45.47 23 44.44 | 23 44.44 23 45.44 | 23 40.75 23 40.56 | 23 37.14 23 40.15 | 23 39.64 23 38.88 | 57 40.47 57 41.57
59 2.88 1.91 | 59 3.91 2.91 | 59 7.60 7.79 | 59 40.25 8.06 8.20 | 59 8.71 9.47 | 25 7.88 6.78
108° ~~0 57.12 58.09~~ | ~~0 56.09 57.09~~ | ~~0 52.40 0 52.21~~ | ~~0 48.79 51.80~~ | ~~0 51.29 50.53~~ | ~~34 52.12 53.22~~
59 2.40 | 3.41 | 7.69 | 8.13 | 9.09 | 25 7.33

− 65 46 22 46 40 | 46 23 46 48 | 46 1 46 25
2.10466n 2.10476n | 2.10466n 2.10479n | 2.10452 2.10466n
− 417 | + 344 | − 1303 | − 1223 | − 2833 | − 1525
2.10049 2.10059 | 2.10810 2.10820 | 2.09163 2.09173 | 2.09243 2.09253 | 2.07633 2.07646 | 2.10300 2.10314
+12604 +12606 | +12826 +12829 | +12349 +12352 | +12372 +12375 | +11927 +11925 | +12677 +12681
+ 1 + 1 | + 1 + 1 | + 3 + 3 | + 2 + 2 | + 5 + 5 | + 2 + 2
+ .07 +.22 +.08 | +.09 +.20 + 0 | +.02 +.56 + .47 | +.15 +.44 +.07 | +.22 +.97 +.09 | +.03 −.19 +.31
+ .16 + .14 | + .16 + .15 | + .33 + .30 | + .35 + .31 | + .86 + .77 | − .39 − .34
+2 6.28 +2 6.29 | +2 8.52 +2 8.45 | +2 3.87 +2 4.32 | +2 4.24 +2 4.15 | +2 0.35 +2 0.16 | +2 6.43 +2 6.80
+ 108 ~~31 3.40~~ 9.16 ~~4.38~~ | ~~3 4.61~~ 12.43 ~~5.54~~ | ~~2 56.27~~ 11.47 ~~56.53~~ | ~~2 56.18~~ 12.30 ~~55.95~~ | ~~2 51.64~~ 9.06 ~~50.69~~ | ~~8.27 58.55~~ 14.36 ~~0.02~~
+10 18.11 20.04 8.20 | + 15.52 17.44 11.36 | + 17.58 19.38 12.11 | + 16.99 18.73 12.35 | + 19.86 21.37 9.63 | 16 5.73 3.95 13.58
+ 1.93 − 24.57 | + 1.92 − 24.97 | + 1.80 − 26.07 | + 1.74 − 26.17 | + 1.57 − 26.87 | + 1.78
− 6.90 | − 7.30 | − 8.40 | − 8.50 | − 8.70 | − 5.40
+10 13.14 | + 10.14 | + 10.98 | + 10.23 | + 12.67 | −16 9.35 ~~4.23~~
11 22.30 21.34 | 11 22.57 21.50 | 11 22.45 23.09 | 11 22.53 22.58 | 11 ~~22.03~~ 21.73 22.30 | 11 4.96 4.23
11 21.82 | 11 22.03 | 11 22.77 | 11 22.55 | 11 ~~22.17~~ 22.01 | 11 4.60
11 4.14 | 4.35 | 5.09 | 4.87 | ~~4.49~~ 4.34

1875

		m	s		′	″	
June	7	52	45.29		48	47.4	
	12		45.65	+ .36		47.0	− .4
	17		46.02	.37		46.7	.3
	22		46.40	.39		46.6	.1
	27		46.80	.39		46.5	.1
July	2		47.20	.40		46.6	+ .1
	7		47.61	.41		46.8	2

1875

7.51 June 20 −.508

7.62 June 24 −.647

52 52 1.8 52 52 20.6
31.2 8.4 31.3 25.6
34.7 15.0 34.8 31.8
37.9 37.9
41.2 41.0
44.3 44.6
47.5 52 35.9 47.8 53 9.0
50.9 39.9 51.2 14.2
54.2 47.8 54.3 20.8
57.5 57.9

399.4 52 8.40 400.8 52 26.00
52 44.378 52 41.20 52 44.533 53 14.67

+ 0.53 +0.16
44.428 +1.56 44.581 +1.89

+ 0.46 +1.65 + 0.19 +1.34
+ 1.55 48.17 + 1.97 47.97
+ 1.65 + 1.34
+ 3.66 + 3.50
52 44.43 44.58
52 48.09 27 16.73 48.08 16.60
−16 6.38 −16 6.44
+ 2.2 +2.3
− 6.10 − 6.20
3 11m 6.45 3 6.26

+35.98 +3.18 +18.53 −30.14
55 55
−1.89 −1.91
2 36.1 2 21.9 2 23.7 2 4.5
6.0 50.9 53.9 35.0
102.1 72.8 77.6 39.5
57 51.05 57 36.40 57 38.80 57 19.75

1.55606 0.50243 1.26788 1.47914
1.17582n 0.12219n 0.88764n 1.09990n
−14.99 −1.32 −7.72 +12.58
57 36.06 57 35.08 57 31.08 57. ~~7.17~~
25 12.29 13.27 25 17.27 32.33
16.02
~~34 47.71 46.73 34 42.73 43.98~~
~~47.22~~ ~~43.35~~ 16.64
25 12.78 46 9 46 28
2.10455n 2.10469n
−1024 −2449
2.09442 2.09452 2.08006 2.08020
+12479 +12432 +12024 +12028
+ 3 + 3 + 5 + 5
+.21 −.38 + 0 +.05 −.35 +.13
−.50 −.47 −.47 −.41
+2 4.03 +2 3.88 +1 59.87 +2 0.05
~~36~~ 27 ~~51.74~~ 16.32 ~~50.61~~ ~~36~~ ~~42.60~~ 7.14 ~~44.03~~
−16 6.70 4.99 7.15 − 6.70 4.97 16.07
+ 1.71 + 1.73
− 6.10 − 6.20
−16 11.09 −16 11.17
11 5.23 6.06 11 6.97 4.90
5

11 5.64 11 ~~5.93~~
5.43

92

τ Virginis.

h m sec
13 55 17
+2° 9′
γ = + 40° 14′
γ sin z = +.64

1874						1875					
May 20	55ᵐ	15.75ˢ		9′	7.5″	June 9	55ᵐ	19.07ˢ		8′	49.0″
25		15.74	-.01		7.8	+.3	14	19.04	-.03	49.3	+.3
30		15.73	.01		8.2	.4	19	19.01	.03	49.7	.4
June 4		15.72	.01		8.6	.4	24	18.98	.03	50.0	.3
9		15.70	.02		9.0	.4	29	18.95	.03	50.4	.4
14		15.68	.02		9.3	.3					
19		15.65	.03		9.7	.4					
24		15.62	.03		10.1	.4					
29		15.58	.04		10.5	.4					

1874			×1874	1875	
× -.35	× -.29	× -.41	-.42	-.50	-.51
June 1	June 2	June 24	June 28	June 8	June 20
-.355	-.220	-.395	-.427	-.485	-.508
13 54 9.8 54 9.3	54 9.2 53 58.1	55 10.1 55 5.6	55 12.2 55 8.2	55 4.6 54 55.5	55 6.3 55 0.4
11.8 11.3	11.3 59.8	12.2 7.2	14.2 10.2	6.8 57.9	8.3 1.9
13.8 13.2	13.4 1.6	14.2 9.0	16.2 12.0	8.8 59.3	10.4 3.6
18.2	17.5	18.4	20.3	12.8	14.7
20.3	19.6	20.5	22.4	15.0	16.6
22.3	21.5	22.5	24.4	17.1	18.6
24.3 54 34.8	23.6 54 33.5	24.6 55 44.9	26.5 55 44.9	19.0 55 29.8	20.7 55 23.2
26.3 37.1	25.8 35.8	26.7 46.7	28.5 48.4	21.1 31.4	22.8 25.2
30.4 39.1	29.9 37.8	30.7 48.5	32.6	25.3 33.3	26.9 26.5
32.4	31.9	32.5	34.7	27.4	29.0
34.5	34.0	34.8	36.8	29.4	31.0
2441 54 11.27	2377 53 59.83	2475 55 7.27	2688 55 10.13	1873 54 57.57	2053 55 1.97
54 22.191 54 57.00	54 21.609 54 35.70	55 22.500 55 46.70	55 24.436 55 46.65	55 17.027 55 31.50	55 18.664 55 24.97
+53.61	+54.08	-6.84	-8.78	+2.17	+0.52
22.176 -.01	21.594 -.01	22.485 -.02	24.421 -.02	17.012 -.02	18.649 -.02
55 15.72	55 15.72	55 15.62	55 15.59	55 19.08	55 19.00
-53.54 -1.64	-54.13 -1.64	+6.86 -1.54	+8.83 -1.51	-2.07 -1.95	-0.35 -1.878
55 14.14	14.03	14.18	14.11	17.21	17.2
+ 53.60	+ 53.98	- 6.84	- 8.76	+ 2.12	+ 0.46 .28
- .01	- .01	- .01	- .02	- .02	- .02
- 1.64 +1.409	- 1.64 +1.409	- 1.54 +1.509	- 1.51 +1.539	- 1.95 ~~+1.099~~	- 1.87 ~~+1.171~~
+ 51.95 58 53.26	+ 52.33 56.66	- 8.42 55.06	- 10.29 58 53.87	+ 0.15 24 57.08	- 1.43 57.80
54 22.18 +10 18.19	54 21.59 +10 15.82	55 22.48 +10 19.10	55 24.42 +10 20.13	55 17.01 -16 5.59	55 18.65 -16 6.38
-13	-13	-12	-12	-1.45	-15
55 14.13 +9.40	55 13.92 +9.30	55 14.06 +7.70	55 14.13 +7.40	55 17.16 +11.10	55 17.22 +10.30
17.179 2 9 19.55	16.969 9 20.48	17.109 9 20.66	17.179 9 20.20	~~20.209~~ 89 1.09	~~20.269~~ 9 0.22
20 +10.92 -34.81	20 +21.78 -14.09	20 +15.23 -24.20	20 +14.31 -22.21	55 +19.46 -14.47	55 +16.69 -6.31
-2.13	-2.12	-1.78	-1.67	-1.96	-1.89
2 47.1 3 45.9	2 28.9 3 16.0	2 39.8 3 30.1	2 42.3 3 28.5	1 26.8 2 11.8	1 29.8 2 1.0
58.8 57.2	39.6 26.9	54.2 45.1	1.3 46.4	46.9 31.2	50.8 21.3
105.9 103.1	68.5 42.9	94.0 75.2	103.6 74.9	73.7 43.0	80.6 22.3
22 52.95 23 51.55	22 34.25 23 21.45	22 47.00 23 37.60	22 51.80 23 37.45	56 36.85 57 21.50	56 40.30 57 11.15
1.03822 1.54170n	1.33806 1.14891n	1.18270 1.38382n	1.15564 1.34655	1.28914 1.16047n	1.22246 0.80003n
1.14391 1.64739n	1.44375 1.25460n	1.28839 1.48951n	1.26133 1.45224	1.41435 1.28568n	1.34767 0.92524n
+13.93 -44.40	+27.78 -17.97	+19.43 -30.87	+18.25 -28.33	+25.96 -19.35	+22.27 -8.42
23 6.88 23 7.15	23 2.03 23 3.48	23 6.43 23 6.73	23 10.05 23 9.12	57 2.81 57 2.10	57 2.57 57 2.73
+1° 59′ 4.47″ 41.20	59 46.32 44.87	59 41.92 41.62	59 38.30 39.23	25 45.54 46.20	25 45.78 45.62
41.33	45.59	41.77	38.76	45.87	45.70
+40 12 36 13 34			12 35 13 20	12 49 13 33	
1.68700 1.68720			1.68700 1.68720	1.68700 1.68720	
-409	+344	-1145	-2823	-142	-1006
1.68291 1.68311	1.69044 1.69064	1.67555 1.67575	1.65877 1.65897	1.68558 1.68578	1.67694 1.67714
-48.19 -48.21	-49.03 -49.05	-47.38 -47.40	-45.58 -45.60	-48.48 -48.50	-47.63 -47.55
-.01 +.12 -.02	-.02 +.10 -.01	-.01 +.68 -.03	-.01 +.70 -.02	-.02 -.29 -.01	-.01 -.36 -.1
+12 +16	+10 +14	+62 +79	+64 +79	-.22 -.34	-.31 -.40
-48.08 -48.07	-48.95 -48.92	-46.77 -46.64	-44.95 -44.83	-48.72 -48.85	-47.85 -47.95
58 53.39 53.13	57.37 53.95	55.15 54.98	53.35 54.40	24 56.82 57.35	57.93 57.67
9 8.4	8.5	10.1	10.4	8 49.0	49.8
+10 1.50 1.50	11.1 12.6	1.50 15.0	17.1 16.0	-16 78 83	81 7.9
+10 1.52	11.8	15.0	16.5	-16 80	80
+10 18.11 9 19.54	+ 15.52 20.84	+ 19.00 20.72	+ 19.86 18.80 19.55	-16 5.73 6.98 0.94	- 6.70 7.90 0.33
- 1.36 16.75 19.28	- 1.35 14.17 19.42	- 1.13 17.87 20.55	- 1.06 -10.25 20.60	- 1.25 1.47	- 1.20 0.07
-8.23	-8.33	-9.93			
+ 9.40	+ 9.30	+ 7.70	+ 7.40	+ 11.10	+ 10.30
+10 26.15 9 19.41	+ 23.47 20.15	+ 25.57 20.63	+ 26.20 20.07	-15 55.88 9 1.20	- 57.60 0.20
9 1.78	2.53	3.00	2.44		

1874   1875
s
α 14.079   17.128
δ +9 17.75   +9' 0.12
+3.049   +3.049
−17.635   −17.632

coord =
coord δ =

tang δ = +.04
I = 2.06 s
k = −.015 s

l. 9.99969   9.99969
.10600   .12552
.10629   .12521

l sin δ 8.57421

−7.48   −7.62

June 21   June 24

−493   .647

55	6.3	55	12.8	55	6.5	54	58.8
	8.3				8.6		0.4
	10.5				10.9		2.1
	14.5				14.7		
	16.6				16.8		
	18.6				18.8		
	20.7	55	426		21.0	55	38.0
	22.8				23.0		39.9
	26.9				27.1		41.5
	29.0				29.2		
	31.0				31.3		
	2052	55	12.80		2077	55	0.53
55	18.655	55	42.60	55	18.882	55	39.80

−			+0.43				+0.16
	18.640		−.02		18.867		−.02
55	19.00			55	18.98		
	−0.36		−1.87		−0.11		−1.85
			17.18				17.16
+	0.46			+	0.19		
−	.02			−	.02		
−	1.87			−	1.85		
−	1.43	24	5764	−	1.68		5896
55	18.64	−16	581	55	18.87	−16	644
			−1.5				−1.6
55	17.21		+10.30	55	17.19		+10.10
		9	063			9	102

	+5.85 s		−23.95		+18.35		−20.92
55				55			
	−1.90				−1.98		
1	44.4	2	23.8	1	26.8	2	19.1
	6.9		46.2		50.1		42.9
	111.3		70.0		76.9		62.0
56	55.65	57	35.00	56	38.45	57	31.00
	0.76716		1.37931n		1.26364		1.32056n
	0.89237		1.50452n		1.38885		1.44577n
	+7.80		−21.96		+24.48		−27.91
57	8.45	57	3.04	57	2.93	57	3.09
25	44.90		45.31	25	45.42		45.26
	45.10				45.34		
				13	0	13	43
					1.68710		1.68720
	−1461				−2443		
	1.67239		1.67259		1.66267		1.66277
	−47.03		−47.05		−45.99		−46.00

−	1	−.42	−.03		−.01	−.38	−.02
	−.34		−.47		−.29		−.45
	−47.38		−47.55		−46.29		−46.47
24	57.52		57.76		59.13		58.79
	498				50.0		
−16	7.7		8.0		9.1		8.8
−16	7.9				9.0		
−16	6.25	7.46	0.36	−	6.70	7.96	1.25
−	1.21		0.60	−	1.26		0.93
+	10.30			+	10.10		
−15	57.16		0.48	−	57.86		1.09

θ Centauri
h m sec.
13 59 20
− 35° 45′
Z = + 78° 8′
sin z = + .98

	1874	1875
α		59 20.02
δ		45 14.78
dα/dt		+ 3.506
dδ/dt		− 18.01

l cos δ 9.90933
l.b .10600
l.b′ .01533
l sin δ 9.76660n

corr α =
corr δ =
tang β = −.72
I = .254
K = −.019

1874

June 1	June 8	June 20	June 21	June 24	June 28
−.355	−.324			−.390	−.427
13 58 9.0 57 49.0	59 4.3 58 58.3	59 5.9 58 58.3	59 5.9 58 46.8	59 5.9 59 14.0	59 6.7 58 52.4
11.5 51.0	6.8 0.3	8.4 59.8	8.4 50.1	8.4 15.8	9.3 54.0
14.3 54.1	9.3 2.4	11.0 2.5	10.9 53.1	11.1	12.0 56.1
19.0	14.4	16.0	16.0	16.2	16.9
21.6	16.9	18.7	18.4	18.7	19.4
24.3	19.4	21.1	21.0	21.2	21.9
26.8 58 40.7	22.0	23.7	23.6	23.6	24.5 59 50.3
29.4 42.5	24.5	26.2	26.2	26.2	27.0 51.8
34.5 45.0	29.5	31.2	31.3	31.4	32.1 54.1
37.0	32.2	33.6	33.8	34.0	34.7
39.6	34.7	36.3	36.4	36.6	37.3
51.37					
26.70 57 ~~51.33~~	21.40 59 0.33	23.21 59 0.20	23.19 58 50.00	23.32 59 14.90	24.18 58 54.17
58 24.273 58 42.73	59 19.455	59 21.100	59 21.082	59 21.200	59 21.982 59 52.67
24.254	19.436	21.081	21.063	21.181	21.963
+ 53.60 + .25 − 1.69 +1.816 + 52.16 58 24.25	+ 56.49 + .23 − 1.66 +1.846 + 55.06 59 19.04	−1.57	−1.56	− 6.87 + .28 − 1.53 +1.976 − 8.12 59 21.18	− 8.76 + .31 − 1.49 +2.016 − 9.94 59 21.98
59 16.41 19.916	0 14.50 18.006			59 18.06 16.566	59 12.04 15.546

	June 1		June 8	June 20	June 21	June 24	June 28	
	0 +32.94	−18.46	+ 19.12	+20.90	+ 31.00	+6.30	+27.81	−30.09
	10		45	45	45	45	45	
	1 −2.13		−2.07			−1.78	−1.67	
	3 14.0	4 10.0	2 17.0	2 21.7	2 12.0	2 45.9	2 18.5	3 19.2
	27.5	21.5	39.3	44.5	36.0	10.4	42.9	43.8
	41.5″	31.5	56.3	66.2	48.0	116.3	61.4	63.0
	13′ 20.75	14 15.75	47 28.15	47 33.10	47 24.00	47 58.15	47 30.70	48 31.50
	1.51720	1.26623	n 1.28149	1.32015	1.49136	0.79934	1.44420	1.47842n
	1.53253	1.28156	n 1.29682	1.33548	1.50669	0.81467	1.45953	1.49375n
	+34.08	−19.12	+19.81	+21.65	+32.11	+6.53	+ 28.81	−31.17
	13 54.63	13 56.63	47 37.96	47 54.75	47 51.89	48 4.68	47 59.57	48 0.33
−35°	51′ 6.48″ 7.38	8.28	24 49.61	25 6.40	25 3.54	25 16.33	25 11.16 11.57	25 11.98
(+78	3 4	3 59)					(37 14	38 14)
	~~−400~~ −400		−1999			−1134	−2811	
	− 9 +.24 +.32 +.13	− 9 +.08 +.17	−.35 +.09 +.09 +.10	−.11 ~~+.23~~ +.35 +.46	− .21 +.25 ~~+.39~~ +.53 +.78	− 23 + 2 ~~+.34~~ +.66 +.68	− .16 +.20 +.87 +.55	−.46 +.23 +.77
	+10 18.11 − 2.08 +17.51 +10 33.54	16.03	+18.85 16.83 − 2.02 +18.13 + 34.96	+18.92	+18.94	+19.00 17.26 − 1.74 +19.10 + 36.36	+19.86 18.23 − 1.63 +19.28 + 37.51	

Draco.
h m sec
14 1 0
+64° 58'
-22° 35
June z = -.38
corr α =
corr δ =

tang δ = +.214
I = 4.87s
k = -.036s

1874				
May 20	0m 62.60s		58' 43.4"	
25	62.49	-.11	44.7	+1.3
30	62.37	.12	45.9	1.2
June 4	62.24	.13	47.0	1.1
9	62.10	.14	47.9	.9
14	61.94	.16	48.7	.8
19	61.77	.17	49.5	.8
24	61.59	.18	50.1	.6
29	61.40	.19	50.7	.6

	1874	1875
α	58.726	0.349
δ	+58 42.38"	+58 25.06
dα/dt	+1.623s	+1.623
dδ/dt	-17.321	-17.320
l cos δ	9.62649	9.62649
l.b	.10600	.12552
l.b'	9.73249	9.75201
l sin δ	9.95716	

1874
X -.35 June 1 -.355 X -.29 June 2 -.220 X -.42 June 8 -.324 X -.38 June 15 -.317 X -.41 June 24 -.395 X -.42 June 28 -.427

13 59 39.6 59 45.2 59 59.0 59 36.6 59 56.3 0 55.5 0 30.6 0 59.6 0 42.6 1 1.4 0 48.2
2.0 50.3 1.5 40.6 59.0 58.0 35.4 2.1 45.1 3.9 51.5
4.6 54.3 3.9 45.6 1.5 0.3 39.0 4.5 51.1 6.3 56.1
7.2 6.6 4.1 2.7 6.8 8.7
9.3 8.9 6.3 5.2 9.4 11.1
11.7 11.3 8.7 7.6 12.0 13.6
14.2 0 17.5 13.7 0 16.6 11.3 10.1 1 27.1 14.2 1 27.1 16.1
16.8 21.6 16.1 20.1 13.7 12.5 32.0 16.6 31.7 18.5
19.1 26.5 18.5 24.9 16.1 15.0 35.8 19.2 36.1 21.0

1445 1395 1770 1669 1444 1006
60 60 120 120 60
845 59 49.93 795 59 40.93 570 469 0 35.00 844 0 46.27 0 51.93
0 9.389 0 21.87 0 8.833 0 20.53 0 ~~6.222~~ 6333 1 5.211 1 31.67 1 9.378 1 31.63 1 11.178

+53.62 +54.08 +56.61 2.53 ~~-3.45~~ -6.84 -8.78
9.353 -.75 8.797 -62 6.297 -90 5.175 -.81 9.342 -.88 11.142 -.90
1 2.331 1 2.3029 1 2.142 1 1.920 1 1.6058 1 1.458
-52986 -358 -53.5049 -356 -55842 -339 +3.257 -317 +7.746 -285 +9.671 -270
58.64 58.70 58 ~~72.52~~ 58.67 58.77 58.76
+ 53.60 + 53.98 + 56.49 .62 - 2.59 .67 - 6.87 - 8.76
- .76 - .47 - .69 - .68 - .84 - .91
- 3.58 -1.957 - 3.56 -1.937 - 3.39 -1.767 - 3.13 -1.547 - 2.85 -1.227 - 2.70 -1.077
+ 49.26 48 2809 + 49.95 3000 + 52.41 - 6.44 3174 - 10.56 3099 - 12.37 48 3053
0 9.35 +10 1819 0 8.80 +10 1582 0 6.30 +10 1960 1 5.17 +10 1767 1 9.34 +10 1910 1 11.14 +10 2013
+.8 +.8 +.8 +.8 +.8 +.8
0 58.61 -4.00 0 58.75 -4.20 0 58.71 0 58.73 -6.50 0 58.78 -7.70 0 58.77 -8.20
0.233 64 58 43.08 0.373 58 42.42 0.333 0.353 58 43.71 0.403 58 43.19 0.393 58 43.26

+ 19.46 -12.48 +27.90 -11.70 +30.21 -26.46 +23.11 -22.25 +19.25
30 30 30 30 30
-2.43 -2.12 -1.98 -1.78 -1.67
4 31.4 4 49.9 4 27.7 4 47.2 A.R. 4 20.2 4 52.2 4 26.0 4 50.5 4 26.2
34.8 52.9 28.9 49.1 26.8 57.2 33.0 56.1 35.4
66.2 102.8 56.6 96.3 47.0 109.4 59.0 106.6 61.6
34 33.10 34 51.40 34 28.30 34 48.15 34 23.50 34 54.70 34 29.50 34 53.30 34 30.80

1.28914 1.09621n 1.44560 1.06819n 1.48015 1.42259n 1.36380 1.34933n 1.28443
1.02163 0.82870n 1.17809 0.80068n 1.21264 1.15508n 1.09629 1.07983n 1.01692
+10.51 - 6.74 +15.07 -6.32 +16.32 -14.29 +12.48 -12.02 +10.40
34 43.61 44.66 34 43.37 34 41.83 34 39.82 34 40.41 34 41.98 34 41.28 34 41.20
48 4.74 3.69
4.21 +64° 48 4.98 6.52 48 8.53 7.94 48 6.37 7.07 48 7.15
6.75 8.23 6.72
-22 35 44 35 26 35 48 35 24
1.37950n 1.37940n 1.37950n 1.37940n
-390 +373 -1303 -1123 -2799
1.37560 1.37550 1.38323 1.38313 1.36647 1.36637 1.36827 1.36817 1.35151 1.35141
+23.75 +23.74 +24.17 +24.16 +23.25 +23.25 +23.35 +23.34 +22.47 +22.46

-.08 +.13 -.03 -.16 +.09 -.03 -.19 +.25 -.14 -.11 +.93 -.10 -.08 ~~+.45~~ +.91
+.18 +.20 +.18 +.19 +.40 +.44 +.99 +1.08 +.99
+23.85 +23.91 +24.19 +24.32 +23.46 +23.55 +24.23 +24.32 +23.38
48 28.59 27.60 29.17 30.84 31.99 31.49 30.60 31.39 30.53
58 46.4 46.6 48.9 50.1 50.6
+10 17.8 18.8 17.4 15.8 16.5 17.4 19.8 18.7 20.1
+10 18.3 16.6 17.1 19.1 20.1
+10 18.11 58 43.50 + 15.52 16.32 41.29 + 17.58 18.33 43.82 + 19.00 19.67 42.57 + 19.86 20.49
+ .80 18.91 42.51 + .80 -21.52 42.96 + .75 -23.82 43.32 + .67 -25.02 43.36 + .63 -25.52
- 4.00 -21.32 - 4.20 - 6.50 - 7.70 - 8.20
+10 14.91 58 43.00 + 12.12 42.12 + 11.83 43.57 + 11.97 42.96 + 12.29 42.82
58 25.68 24.80 26.25 25.64 25.50

1875

	m	s		′	″	
June 9	1	4.04		58	28.1	
14		3.87	-.17		28.8	+.7
19		3.69	.18		29.5	.7
24		3.52	.17		30.2	.7
29		3.34	.18		30.9	.7

1874.0 α	δ	1875.0 α	δ
58.61		0.31	
75		34	
71		42	
73		40	
78		39	
77		41	
58.725		0.378	
.726	42.38	.349	25.06
−.001		+.029	

1875

-50 June 8 -485	-145 June 10 -442	-144 June 15 -453	-151 June 20 -508	-148 June 21 -493	-162 June 24 -647
0 0 41.6	0 0 10.8	0 0 39.6	0 0 11.0	0 0 34.6	0 0 32.6
53.2 45.3	53.4 14.7	53.7 44.8	54.5	54.6 37.6	55.0 35.7
55.5 48.7	56.0 18.4	56.1 48.4	57.2	57.1 42.8	39.7
58.0	58.2	58.6	59.6	59.5	59.9
1 0.6	1 0.5	1 1.2	1 1.9	1 1.9	
3.0	3.0	3.5	4.4	4.2	4.8
5.5 1 20.4	5.3 0 56.5	6.0 1 23.7	6.9	6.6 1 16.2	
7.9 23.0	7.9 59.3	8.2 29.1	9.2	9.1	9.7
10.5 28.9	10.3 3.6	10.8 32.2	11.6	11.6	
12.9	12.9	13.0	14.0	13.9	14.6
2069	2075	2111	2193	2185	1440
180	180	180	180	180	120
269 0 45.20	273 0 14.63	311 0 44.27	393 0 11.00	385 0 38.33	240 0 36.00
1 2.989 1 24.40	1 3.056 0 59.80	1 3.456 1 28.33	1 4.367	1 4.278 1 16.20	1 4.800
+2.17	+1.91	+1.46	+0.52	+0.44	+0.16
2.953 -1.07	3.020 -.96	3.420 -.94	4.331 -1.09	4.242 -1.03	4.764 -1.33
1 4.087	1 4.020	1 3.848	1 3.675	1 3.631	1 3.531
-1.132 -3.72	− ~~1.00~~ 0.98 -3.65	-0.481 -3.48	+0.688 -3.30	+0.643 -3.26	+1.235 -3.16
1ᵐ 0.33	0.32	0.46	0.46	0.39	0.43
+ 2.12	+ 1.91	+ 1.45	+ 0.46	+ 0.46	+ 0.19
− 1.04	− .94	− .97	− 1.09	− 1.05	− 1.38
− 3.72	− 3.65	− 3.48	− 3.36	− 3.26	− 3.16
− 2.64 14 32.64	− 2.68 34.81	− 3.00 34.92	− 3.93 36.13	− 3.85 34.77	− 4.35 36.52
1 2.95 -16 55.9	1 3.02 -16 71.4	1 3.42 -16 78.5	1 4.33 -16 63.8	1 4.24 -16 58.1	1 4.76 -16 64.4
+.9	+.9	+.9	+9	+.9	+9
1 0.31 -290	1 0.34 -320	1 0.42 -390	1 0.40 -460	1 0.39 -470	1 0.41 -510
58 25.05	58 25.37	58 24.57	58 26.05	58 25.16	58 23.88
5 +17.79 -21.41	5 +48.43 +3.26	5 +19.19 -24.87	5 +53.37	5 +25.95 -11.92	5 +28.80
-1.96	-1.94	-1.88	-1.89	-1.90	-1.91
3 18.4 3 40.3	2 57.9 3 24.1	3 13.1 3 39.3	2 51.9	3 9.0 3 29.8	3 4.7
40.5 0.9	19.9 45.9	37.2 1.1	16.8	34.5 54.9	30.2
58.9 101.2	137.8 100	50.3 100.4	128.7	43.5 84.7	34.9
8 29.45 8 50.60	8 8.90 8 35.00	8 25.15 8 50.20	8 4.35	8 21.75 8 42.35	8 17.45
1.25018 1.33062ₙ	1.68511 0.51322	1.28307 1.39568ₙ	1.72730	1.41414 1.07628	1.45939
1.00219 1.08263ₙ	1.43712 0.26525	1.03508 1.14769ₙ	1.47931	1.16615 0.82829	1.21141
+10.05 -12.10	+27.36 +1.84	+10.84 -14.05	+30.15	+14.66 -6.73	+16.27
8 39.50 8 38.50	8 36.26 8 31.84	8 35.99 8 36.15	8 34.50	8 36.41 8 36.62	8 33.72
14 8.85 9.85	14 12.09 11.51	14 12.36 14 12.20	14 13.85	14 11.94 12.73	14 14.63
9.35	11.80	12.28		12.33	
35 19 34 58				35 26 35 6	
1.37930ₙ 1.37920ₙ				1.37940ₙ 1.37920ₙ	
-116	-413	-1018	-961	-1443	-2424
1.37814 1.37804	1.37517 1.37507	1.36912 1.36902	1.36969 1.36959	1.36497 1.36487	1.35576 1.35496
+23.89 +23.88	+23.72 +23.72	+23.39 +23.39	+23.43 +23.42	+23.17 +23.16	+22.65 +22.64
-.07 -.59 -.09	-.49 -.71 0	-.08 -.75 -.13	-.59 ~~-.57~~	-.14 -.72 -.03	-.17 ~~-.38~~
-.49 -.53	-.43 -.50	-.61 -.68	-.56 -1.15	-.61 -.67	-.59 -.76
+23.47 33 +23.26	+22.80 +23.22	+22.70 +22.58	+22.28	+22.42 +22.46	+21.89
14 32.18 33.11	34.89 34.78	35.06 34.78	36.13	34.36 35.15	36.52
58 28.0	28.3	29.0	29.7	29.8	30.2
-16 4.8 5.1	6.6 6.4	6.1 5.8	6.4	4.6 5.4	6.3
-16 4.7	6.5	5.9	6.4	5.0	6.3
-16 5.73 58 24.29	− 7.34 6.61 25.08	− 6.72 6.01 25.15	− 6.70 5.99	− 6.25 5.53 24.13	− 6.70 5.98
+ .74 4.99 25.22	+ .73 24.92	+ .71 24.87	+ .71	+ .72 24.96	+ .72
− 2.90	− 3.20	− 3.90	− 4.60	− 4.70	− 5.10
-16 7.89 58 24.75	− 9.81 25.00	− 9.91 25.01	− 10.59 25.54	− 10.23 24.54	− 11.08 25.44

α Bootis 07

h m sec.
14 4 42
+25° 41m
β = +16 42
sin z = +.29

1874					
May 20	4m 41.15		41′	18.7″	
25	41.14	-.01		16.6	+.9
30	41.12	.02		17.4	.8
June 4	41.10	.02		18.2	.8
9	41.07	.03		19.0	.8
14	41.03	.04		19.7	.7
19	40.99	.04		20.4	.7
24	40.94	.05		21.0	.6
29	40.89	.05		21.6	.6

	1874	1875
α	39.201	41.940
δ	+41′ 21.75″	+41 45.4
dα/dt	+2.739	+2.739
dδ/dt	-17.214	-17.212
l cos δ	9.95482	9.95482
l.b	.10600	.12552
l.b′	.06083	.08034
l sin δ	9.63689	

6.691
6.737
6.328

X -35		X -29		X -42		X -45		X -38		X -41	
1874 June 1		June 2		June 9		June 10		June 15		June 24	
-355		-220		-420		-400		-317		-395	
14 3 33.8	3 25.3	3 33.3	3 24.0	3? 30.9	3? 29.5	14 3? 30.9	14 3? 20.0	4 3? 30.1	4 3? 26.9	4 34.3	4 29.3
36.1	27.8	35.6	26.6	4 33.2	4 31.4	4 33.3	4 22.4	4 32.3	29.0	36.5	31.6
38.5	30.0	38.0	28.6	3 35.6	3 33.5	35.6	24.7	34.6	31.0	38.9	33.4
43.0		42.5		40.1		40.1		39.0		43.4	
45.3		44.8		42.3		42.4		41.4		45.7	
47.7		47.0		44.7		44.7		43.8		47.9	
49.8	4 7.5	49.5	3 57.6	47.0	4? 13.5	46.9	5 4.6	46.0	5 2.6	50.2	5 17.3
52.2	10.7	51.8	59.8	49.2	5 16.3	49.2	7.1	48.2	3.9	52.5	19.7
56.7	13.0	56.4	1.6	53.7	4 18.6	53.7	9.2	52.8	5.1	57.1	22.4
58.9		58.7		56.1		56.1		55.2		59.4	
1.3		0.7		58.4		58.4		57.5		1.6	
4633		4583		4912		4912		4809		4675	
60		60								60	
523 3	3 27.70	518 3	3 26.40		4 31.47		4 22.37		4 28.97	527 5	4 31.43
3 47.573	4 10.40	3 47.209	3 59.67	3 44.655	4 16.19	3 44.655	5 6.97	3 43.718	5 3.87	4 47.955	5 19.80
	+53.62	47.118	+54.08	4 3	+56.57	4	-3.42	4	-2.53		-6.84
47.556	-16	47.101	-14	44.638	-20	44.638	-21	43.701	-18	47.938	-19
4 41.11		4 41.11		4 41.07		4 41.06		4 41.02		4 40.94	
-53.55	-1.91	-54.01	-1.91	-56.43	-1.87	-56.42	-1.86	-57.32	-1.82	+7.00	-1.74
-53.46	4m 39.11	-53.91	39.13	-56.34	39.14	-56.32 ∫	39.15	-57.23 ∫	39.17	+7.10	39.17
+ 53.60		+ 53.98		- 3.45		- 3.50		- 2.59		- 6.87	
+ .17		+ .10		- .20		- .19		- .15		+ .18	
- 1.91	+0.829 31 050	- 1.91	+0.829 348	- 1.87	+0.869 016	- 1.86	+0.879 298	- 1.82	+0.919 319	- 1.74	+0.999 251
+ 51.52	+10 1819	+ 51.97	+10 1582	- 5.52	+10 2011	- 5.55	+10 1728	- 4.56	+10 1767	- 8.79	+10 1910
3 47.56	-.6	3 47.10	-.5	3 4 44.64	-.6	3.4 44.64	-.5	3 4 43.70	-.5	4 47.94	-.5
	+400		+390		+280		+260		+190		+080
4 39.08 25	41 22.09	4 39.07	41 22.70	3 39.12	41 22.47	3 39.09	41 22.36	3 39.14	41 22.26	4 39.15	41 21.91
41.819	2	41.809 .72	.55	4 41.859		4 41.829		4 41.879		41.889	
+19.87	-24.83	+20.84	-12.46	+ 13.18	- 31.48	+ 22.28	- 22.32	- ~~45.25~~ +14.75	~~-80.15~~ -20.15	+16.52	-31.85
50		50		50		50		50	50		
-2.13		-2.12		-2.06		-2.04		-1.98		-1.78	
0 2.9	1 51.7	0 59.1	1 38.0	1 6.3	1 58.2	0 56.9	1 48.5	0 3.9	1 44.9	1 3.1	1 59.8
13.0	2.0	7.5	46.4	26.5	17.2	6.5	58.7	1 16.9	57.1	16.8	2.5
15.9″	11.37	12.66	8.44	3.28	13.54	12.34	10.72	20.8	10.20	19.9	12.23
50′ 7.95 (51)	51 56.85	51 3.30	51 42.20	51 16.40	52 7.70	51 1.70	51 5.36	51 10.40	51 51.00	51 9.95	52 1.15
1.29820	1.35851	1.31639	1.09864	1.11992	1.49803	1.34792	1.34869	1.16879	1.30428	1.21801	1.50311
1.35902	1.41933	1.37721	1.15946	1.18074	1.55885	1.40874	1.40951	1.22961	1.36510	1.27883	1.56393
+22.86	-26.26	+23.83	-14.44	+15.16	-36.21	+25.63	-25.68	+16.97	-23.18	+19.00	-36.64
51 30.81	51 30.59	51 27.13	51 27.76	51 31.56	51 31.49	51 27.33	51 27.92	51 27.37	24.82	51 28.95	51 24.51
+25° 31 17.54″	17.76	31 21.22	20.59	31 16.79	16.86	31 21.02	20.43	31 20.98	20.53	31 19.40	18.84
17.65		20.90		16.82		20.72		20.75		19.12	(18 ?)
+16 40 58	41 40										
1.23700	1.23730										
-378		+386		-1671		-577		-1303		-1109	
1.23322	1.23352	1.24086	1.24116	1.22029	1.22059	1.23123	1.23153	1.22397	1.22427	1.22591	1.22621
-17.11	-17.12	-17.41	-17.42	-16.61	-16.62	-17.03	-17.04	-16.75	-16.76	-16.82	16.84
-.08 -03	-11	-.09 .10	-.03	-.03 -05	-20	-10 -71	-1.94	-42 -80	-1.37	-05 +22	-21
+.00 4	+.08	+.04	+.07	+.05	+.08	+.04	+.08	+.02	+.16	+.26	+.44
-17.15	-17.15	-17.46	-17.38	-16.59	-16.74	-17.09	-18.40	-17.15	-17.97	-16.61	-16.61
31 0.35	0.61	3.76	3.21	0.20	0.12	3.90	2.03	3.83	2.56	2.75	2.23
41 17.8		17.9		19.0		19.2		19.9		21.0	
+10 17.4	17.2	14.1	14.1	18.8	18.5	15.2	18.2	17.1 2	8.3 2	18.2	18.8
+10 17.3		14.4		18.9		16.7		17.2		18.5	
+10 18.11	41 21.89	+15.52	14.91 22.56	+19.69	19.10 22.10	+16.68	16.09 22.62	+17.58	17.01 22.74	+19.00	18.49 ~~22.18~~ 22.08
- .61	17.50 22.11	- .61	-13.31 22.61	- .59	-14.41 22.02	- .59	-14.61 20.72	- .57	-15.31 22.47	- .57	-18.41 ~~22.02~~ 21.52
+ 4.00	-13.21	+ 3.90		+ 2.80		+ 2.60		+ 1.90		+ 0.80	~~27.40~~ 21.80
+10 21.50	41 22.00	+ 18.80	22.28	+ 21.90	22.06	+ 18.69	21.67	+ 18.91	22.10	+ 19.21	4.19 4.59
	41 4.79		5.07		4.85		4.45		4.89		

1875

cons α = −.095ˢ
cons δ = −.04"
lang δ = +.47
I = 2.28ˢ
k = −.017ˢ

June 9	4ᵐ	44.12ˢ		40'	59.4	
14		44.08	−.04		60.0	+.6
19		44.04	.04		60.6	.6
24		44.00	.04		61.2	.6
29		43.95	.05		61.9	.7

× 1874 −.42 June 28 −.427		1875 −.50 June 8 −.485		−.45 June 10 −.442		−.45 June 14 −.440		−.62 June 24 −.647		−.54 June 28 −.530	
4 36.1 38.4 40.7 45.3 47.5 49.9 52.2 54.5 56.9 1.3 3.5	4 27.0 29.0 30.7 5 16.3 18.6 20.7	4 28.5 30.8 32.9 37.4 39.8 42.1 44.3 46.7 51.2 53.6 55.8	4 12.7 14.6 16.1 5 6.6 8.9 10.4	4 28.7 31.0 33.3 37.8 40.0 42.4 44.6 47.0 51.5 53.8 56.0	4 20.0 22.3 23.8 5 0.2 2.4 4.6	4 28.8 31.0 33.4 37.8 40.3 42.6 44.9 47.1 51.6 54.1 56.5	4 19.3 21.4 23.2 5 1.0 2.6 4.1	4 30.3 32.7 34.9 39.6 41.8 44.1 46.4 48.8 53.4 55.5 57.8	4 15.9 18.0 20.0 4 50.0 52.4 54.1	4 31.0 33.4 35.7 40.2 42.5 44.8 47.1 49.4 53.9 56.2 58.5	4 25.5 27.3 29.3 5 5.7 8.0 10.2
4283 120 5483		3 4641		4661		4681		4853		4927	
4 49.845 49.828 4 40.90 +8.93 +9.02	4 28.90 5 18.53 −8.78 −.20 −1.70 39.15	4 ~~42191~~ 42.100 42.083 4 44.13 −2.05 −1.95	4 14.47 5 8.63 +2.18 −.24 −2.19 41.83	4 42.373 42.356 4 44.11 −1.75 −1.66	4 22.03 5 2.40 +1.91 −.21 −2.17 41.89	4 42.555 42.538 4 44.08 −1.54 −1.44	4 21.30 5 2.57 +1.71 −.21 −2.14 41.90	4 44.118 44.101 4 44.00 +0.10 +0.19	4 17.97 4 52.17 +0.17 −.29 −2.06 41.92	4 44.791 44.774 4 43.96 +0.81 +0.91	4 27.37 5 7.97 −0.63 −.27 −2.02 41.85
− 8.76 ÷ .20 ~~1.70~~ +1.039 + 1.04 − 10.66 4 49.83 4 39.17 41.909	31 2.62 +10 20.13 −5 +0.30 41 22.55	+ 2.12 − .23 − 2.19 − 0.30 4 42.08 4 41.78	57 5.50 −16 5.59 −.8 +5.20 41 4.31	+ 1.91 − .21 − 2.17 − 0.47 4 42.36 4 41.89	6.95 −16 7.14 −.7 +5.00 41 4.11	+ 1.70 − .20 − 2.14 − 0.64 4 42.54 4 41.90	6.85 −16 7.14 −.8 +4.50 41 3.41	+ 0.19 − .30 − 2.06 − 2.17 4 44.10 4 41.93	8.89 −16 6.44 −.7 +3.30 41 5.03	− 0.63 − .25 − 2.02 − 2.90 4 44.77 4 41.87	10.55 −16 7.99 −.8 +2.70 41 4.46
+20.94 50 −1.67	8 −29.69	20 +27.63 −1.96	−26.53	20 +20.34 −1.94	−20.03	20 +21.25 −1.91	−20.02	20 +26.16 −1.91	−8.05	20 +17.42 −1.93	−23.18
0 57.1 14.9 13.20 51 6.00	1 54.9 9.9 12.48 52 2.40	4 40.1 3.2 10.33 24 51.65	0 45.4 8.9 11.43 25 57.15	4 48.9 11.1 12.00 25 0.00	0 37.1 58.8 9.59 25 47.95	4 46.9 10.2 11.71 24 58.55	0 36.2 59.5 9.57 25 47.85	4 39.0 3.9 10.29 24 54.45	0 19.1 46.3 6.54 25 32.70	4 47.1 13.7 12.08 25 0.40	0 35.7 2.0 9.77 25 48.85
1.32098 1.38180 +24.09 51 30.09	1.45778 ~~1.53807~~ 1.51855 ~~−34.52~~ −33.60 57 ~~27.88~~ 29.40	1.44138 1.52172 +33.25 25 24.90	1.42374 1.50408 −31.92 25 25.23	1.30835 1.38869 +24.47 25 24.41	1.30168 1.38202 −24.10 25 23.85	1.32736 1.40770 +25.57 25 24.12	1.30146 1.38180 −24.09 25 23.76	1.40747 1.48781 −30.75 25 20.70	0.90580 0.98614 −9.69 25 23.01	1.24105 1.32139 +20.96 25 21.36	1.36511ₙ 1.44545ₙ −27.89 25 20.96
31 18.26 18.60	18.95	57 23.45 23.28	23.12	57 23.88 24.19	24.50	57 24.23 24.41	24.59	57 27.65 26.49	25.34 57	26.99 27.19	27.39
40 49 1.23690 −27.84	41 45 1.23730	41 4 1.23700 −1.01	42 9 1.23740	−4.13		−5.08		−24.13		41 12 1.23710 −20.05	42 1 1.23740
1.20906 −16.18	1.20946 −16.20	1.23599 −17.22	1.23639 −17.23	1.23287 −17.10	1.23327 −17.11	1.23192 −17.06	1.23232 −17.07	1.21287 −16.33	1.21327 −16.34	1.21705 −16.48	1.21735 −16.49
−.09 +.26 +.22 −16.03 2.23 2.15 1.93 1.89	−.17 +.44 −15.93 3.02 1.85	−.16 −.56 −.69 −18.07 57 5.88 40 59.3 −16 6.1 −16 7.62	−.14 −.13 −17.50 5.62 6.3	−.08 −.13 .00 −17.18 6.70 59.5 7.2 7.5	−.08 −.11 −17.30 7.20 7.7	−.09 −.49 +.70 −17.85 6.38 6.00 6.4 6.8	−.08 −.11 −17.26 7.33 7.3	−.14 −.56 −.88 −17.35 10.30 6.12 8.1 8.4	−.12 −.15 −.09 −16.45 8.88 7.7	−.06 .00 −16.54 10.45 6.18 8.86 8.9	−.15 −.11 −.14 −16.74 10.65 8.8
.08 +10 19.86 .52 − .48 1.80 + 0.30 1.59 + 19.68	19.38 21.91 −16.91 22.70 22.30 5.09	−16 5.73 − .56 + 5.20 −16 1.09	41 4.29 6.29 4.53 41 4.41	− 17.34 − .56 + 5.00 − 2.90	7.90 3.80 4.30 4.05	− 7.28 .55 + 4.50 − 3.33	7.83 3.05 4.00 3.52	− 6.70 − .55 + 3.30 + 3.95	7.25 ~~13.25~~ ~~5.5~~ ~~12.84~~ 4.54 13.09 4.94	− 8.05 − .55 + 2.70 − 5.90	8.60 4.55 4.75 4.65

1874 | 1875

Vens. min. 15
h m sec.
14 9 22
+78° 8'
ζ − 35° 45'
sin ζ = −.58

cos α = −.211
cos δ = +.46"
tang δ = +4.74
I = 1.000 s

May 30 9m 29.62 s 7' 86.2"
June 4 29.29 −.33 87.2 +1.0
9 28.93 .36 88.2 1.0
14 28.55 .38 89.0 .8
19 28.14 .41 89.8 .8

June 9 9m 28.89 s 7' 68.8"
14 28.51 −.38 69.7 +.9
19 28.10 .41 70.4 .7
24 27.67 .43 71.0 .6
29 27.22 .45 71.5 .5

1875
α 22.276 s
δ +8' 4.92"
dα/dt −0.336 s
dδ/dt −16.925"

1874
α 22.612 s
δ +8' 21.85
dα/dt −0.337
dδ/dt −16.925
l cos δ 9.31310
l c .10600
l c' 9.41910

1875
l cos δ 9.31310
l c 0.12552
l c' 9.43862

l sin δ 9.99062
9.804
6.837
6.041

k = −.074

X 1874 −35 June 1 −.355
X 1874 −45 June 10 −.405
+10 s 1875 −50 June 8 −.485
+10 s −45 June 10 −.442
+10 s +45 June 14 −.440
+10 s −44 June 15 −.453

14 8 17.1 7 22.6 9 14.2 8 38.6 9 — 7 37.4 9 — 7 30.5 9 — 7 24.7 9 — 7 13.0
22.7 31.0 18.9 50.2 — 45.9 — 39.7 — 33.5 — 21.3
27.6 39.8 23.9 49.9 8.9 54.3 8.9 45.8 8.7 42.2 8.6 26.6
32.7 29.0 13.9 13.6 13.6 13.6
37.4 34.2 18.8 18.5 18.6 19.0
42.7 39.1 23.5 23.6 24.0 23.9
47.6 8 51.0 44.4 29.0 8 9.9 28.9 8 11.2 28.6 8 26.7 29.0 8 11.0
52.0 9 2.6 49.2 — 19.8 — 18.0 — 32.1 — 17.6
57.5 12.7 54.6 — 27.6 — 27.0 — 41.6 — 24.1
94.1

33.78 7 31.13 30.75 8 49.57 | 7 55.87 93.3 7 48.67 93.5 7 43.47 94.1 7 30.30
8 37.533 9 2.10 9 34.167 | 9 28.820 8 29.10 9 28.660 8 28.73 9 28.700 8 43.47 9 28.820 8 47.57 2

+53.62 | −3.42 | +2.18 | +1.91 | +1.71 | +1.46
37.459 −1.66 34.093 −2.13 28.746 −2.37 28.586 −2.13 28.626 −2.13 28.746 −2.09
9 29.547 47 9 ~~29.0~~ 28.83 2 9 28.96 9 28.80 9 28.49 9 28.41
−52.051 −6.86 −54.93 +6.16 −6.22 −10.21 −6.68 −10.21 −6.52 −9.86 +14 −6.21 −9.66 +34 −6.13
−51.80 9 9m 22.56 +6.37 22.32 −10.00 21.88 −10.00 21.86 −9.65 +0.35 22.00 −9.45 +0.55 21.99

+ 53.60 | − 3.50 | + 2.12 | + 1.91 | + 1.70 | + 1.45
− 1.68 | − 1.92 | − 2.30 | − 2.09 | − 2.08 | − 2.15
− 6.86 − 7.197 58 7.55 | − 6.22 6.557 58 11.95 | − 6.66 8 24 16.00 | − 6.52 17.73 | − 6.21 17.91 | − 6.13 19.04
+ 45.06 +10 18.19 | − 11.64 +10 17.28 | − 6.86 −16 5.59 | − 6.70 −16 7.14 | − 6.59 −16 7.14 | − 6.83 −16 7.35
8 37.46 +1.2 | 9 34.09 +1.2 | 9 28.75 +13 | 9 28.59 +14 | 9 28.63 +14 | 9 28.75 +14
−4.80 | −6.60 | −3.80 | −4.10 | −4.80 | −5.00
9 22.52 78 8 22.14 | 9 22.45 8 23.83 | 9 21.89 8 7.91 | 9 21.89 8 7.89 | 9 22.04 8 7.37 | 9 21.92 8 8.09
~~22.197~~ 22.183 | 22.113

+66.40 −24.57 +44.60 | +92.95 +59.72 +99.99 +59.93 +105.23 +45.28 +118.52 +61.25
25 25 | 55 55 55 55
−2.18 −2.04 | −1.96 −1.94 −1.91 −1.88

0 2.9 0 27.0 0 3.5 | 3 35.5 3 45.2 3 31.4 3 43.1 3 29.1 3 46.7 3 23.0 3 40.4
5.4 30.1 7.2 | 57.2 8.2 53.7 5.5 52.0 10.2 47.2 4.4
8.3 57.1 10.7 | 92.7 113.4 85.1 108.6 81.1 116.9 70.2 104.8
25 4.15" 25 28.55 25 5.35 | 58 46.35 58 56.70 58 42.55 58 54.30 58 40.35 58 58.45 58 35.10 58 52.40

1.82217 1.39041n 1.64933 | 1.96825 1.77612 1.99996 1.77764 2.02203 1.65543 2.07372 1.78711
1.24127 0.80951n 1.06843 | 1.40687 1.21474 1.43858 1.21626 1.46065 1.09405 1.51234 1.12273
+17.43 −6.45 +11.71 | +25.52 +16.40 +27.45 +16.45 +28.88 +12.42 +32.53 +13.36
25 21.58 25 22.10 25 17.06 | 59 11.87 59 13.10 59 10.00 59 10.75 59 9.43 59 10.87 59 7.63 59 5.76

57 26.77 26.25 57 31.29 | 23 36.48 35.25 23 38.35 37.60 23 38.92 37.48 23 40.72 42.59
26.51 | 35.86 37.97 38.20 40.42

35 44 13 44 49 | 45 2 44 51 | 45 13 44 56
1.61710n 1.61720n | 1.61730n 1.61730n | 1.61740n 1.61730n
−364 −560 | −81 −413 −485 −984
1.61346 1.61356 1.61150 1.61160 | 1.61649 1.61649 1.61317 1.61317 1.61245 1.61245 1.60756 1.60746
+41.06 +41.07 +40.88 +40.89 | +41.35 +41.35 +41.04 +41.04 +40.97 +40.97 +40.51 +40.50

− 1 −.02 −.06 −.22 ~~−.11~~ −.22 | − .95 −1.21 .39 −1.10 −1.28 −.39 − 1.2 −1.26 −.22 −1.54 −1.65 −.42
.00 +.02 .00 | −.53 −.55 −.52 −.55 −.52 −.56 −.65 2.19 −.70
+41.05 +41.03 +40.66 | +39.87 +40.41 +39.42 +40.10 +39.23 +40.19 +38.32 +39.38
58 7.82 7.28 11.95 | 23 16.35 15.66 17.79 19.70 18.15 18.67 19.04 21.97
8 26.6 28.4 | 8 8.7 9.0 9.7 9.9
+10 18.5 19.3 16.5 | −16 7.7 7.0 8.8 8.7 8.4 8.0 9.1 12.1
+10 19.05 16.52 | ~~−16~~ 7.35 8.75 8.20 10.60
+10 19.5 8 ~~21.50~~ 22.36 16.9 | −16 6.9 8 7.95 8.3 ? 7.45 7.7 ? 7.17 .101 ? 8.41
+10 18.11 19.34 ~~20.76~~ 21.82 + 16.68 17.86 | − 16 5.73 4.60 7.26 − 7.34 6.22 7.38 − 7.28 6.18 6.69 − 6.72 56.3 ~~4.34~~
+ 1.23 −21.72 + 1.18 −23.52 | + 1.13 + 1.12 + 1.10 + 1.89
− 4.80 8 ~~22.20~~ 22.09 − 6.60 23.21 | − 3.80 8 7.60 − 4.10 7.41 − 4.80 6.93 − 5.00 ~~9.67~~ 8.41
+10 14.54 8 ~~12.3~~ 5.17 + 11.26 6.29 | − 16 8.40 − 10.32 − 10.98 − 12.63

α Bootis 17

h m sec
14 9 58
+ 19° 50′
τ = + 22ª 33′
ρ sin z = +38

1874

May	20	9m	56.70		50′ 13.8″	
	25		56.69	−.01	14.7	+.9
	30		56.68	.01	15.5	.8
June	4		56.66	.02	16.2	.7
	9		56.64	.02	16.9	.7
	14		56.61	.03	17.5	.6
	19		56.57	.04	18.1	.6
	24		56.53	.04	18.6	.5
	29		56.48	.05	19.0	.4

1874
α 54.861
δ +50′ 21.95
+2.734
−18.885

l cos δ 9.97344
l b .10600
l b′ .07944
l sin δ 9.53056

corr α =
corr δ =
long δ = +36
I = 2.19s
k = −.016s

1874

× −29 June 2 −.220 | × −42 June 9 −.420 | × −38 June 15 −.317 | × −41 June 24 −.395 | × −42 June 28 −.427 | × −52 June 30 −.555

14 8 49.6 8 42.7 | 8 47.2 8 36.1 | 9 46.3 9 39.5 | 9 50.5 9 40.8 | 9 52.3 9 48.2 | 9 53.4 9 48.5
51.7 44.8 | 49.3 38.4 | 48.5 41.4 | 52.7 43.2 | 54.5 50.1 | 55.5 50.4
53.9 46.9 | 51.6 40.4 | 50.6 43.5 | 54.8 45.2 | 56.8 51.8 | 57.7 52.4
58.3 | 53.9 | 55.0 | 59.2 | 1.0 | 2.1
0.6 | 58.2 | 57.2 | 1.4 | 3.3 | 4.3
3.8 | 0.3 | 59.3 | 3.6 | 5.5 | 6.6
4.9 9 14.8 | 2.5 9 20.6 | 1.4 10 9.7 | 5.8 10 23.6 | 7.6 10 19.1 | 8.6 10 19.0
7.1 16.9 | 4.7 23.1 | 3.7 11.9 | 8.1 25.5 | 9.7 21.4 | 10.8 21.2
11.5 19.0 | 9.1 25.4 | 8.2 13.9 | 12.3 28.3 | 14.3 23.3 | 15.3 22.9
13.7 | 11.2 | 10.4 | 14.6 | 16.4 | 17.4
15.9 | 13.4 | 12.6 | 16.7 | 18.6 | 19.8

2710 | 3034 | 3532 | 2796 | 2400 | 2505
240 | 300 | 300 | 240 | 180 | 180
310 8 44.80 | 3.4 8 38.30 | 6532 9 41.47 | 396 9 43.07 | 600 9 50.03 | 7015 9 50.43
9 2.818 9 16.90 | 9 0.309 9 23.03 | 9 59.382 10 11.63 | 10 3.600 10 25.80 | 10 5.455 10 21.27 | 10 6.409 10 21.03
+54.08 | +56.57 | −2.53 | −6.84 | −8.78 | 500 −9.81
2.802 −.10 | 0.293 −.15 | 59.366 −.14 | 3.584 −.15 | 5.439 −.15 | 6.393 −.19
9 56.67 | 9 56.64 | 9 56.60 | 9 56.53 | 9 56.49 | 9 56.47
−53.87 −1.81 | −56.35 −1.78 | +2.77 −1.74 | +7.05 −1.67 | +8.95 −1.63 | +9.92 10.01 −1.61
9 54.97 | 54.93 | 54.96 | 54.92 | 54.88 | 54.87
+ 53.98 | − 3.45 | − 2.59 | − 6.87 | − 8.76 | − 9.80
− .08 | − .15 | − .11 | − .14 | − .15 | − .20
− 1.81 +0.924 | − 1.78 +0.954 | − 1.74 +0.994 | − 1.67 +1.064 | − 1.63 +1.104 | − 1.61 +1.124
+ 52.09 +039 59.84 | − 5.38 56.65 | − 4.44 40 04.2 | − 8.68 +039 59.04 | − 10.54 57.86 | − 11.61 56.89
9 2.80 +10 15.82 | 9 0.29 +10 20.11 | 9 59.37 +10 17.67 | 10 3.58 +10 19.10 | 10 5.44 +10 20.13 | 10 6.48 +10 21.42
−.8 | −.8 | −.7 | −.7 | −.6 | −.6
9 54.89 +5.90 | 9 54.91 +5.10 | 9 54.93 +4.40 | 9 54.90 +3.40 | 9 54.90 +3.10 | 9 54.87 +2.90
57.624 19 50 20.76 | 57.644 50 21.06 | 57.664 50 21.79 | 57.634 50 20.84 | 57.634 50 20.51 | 57.604 50 20.61

+18.02 −14.08 | +22.01 −22.72 | +17.91 −12.25 | +20.53 −22.20 | +15.42 −15.82 | +15.98 −14.62
40 | 40 | 40 | 40 | 40 | 40
−2.12 | −2.06 | −1.98 | −1.78 | −1.67 | −1.61
1 57.2 2 37.0 | 1 51.5 2 45.7 | 1 56.1 2 33.4 | 1 54.8 2 46.8 | × 2 1.0 2 38.1 | 1 59.1 2 34.9
7.0 47.1 | 12.6 6.8 | 8.9 47.7 | 8.1 0.2 | 18.8 56.9 | 18.9 55.9
1242 841 | 1241 1125 | 1250 811 | 1229 1070 | 198 950 | 1380 908
42′ 2.10″ 42 42.05 | 42 2.05 42 56.25 | 42 2.50 42 40.55 | 42 1.45 42 53.50 | 4× 2 9.90 42 47.50 | 42 9.00 42 45.40

1.25575 1.14860n | 1.34262 1.35641n | 1.25310 1.08814n | 1.31239 1.34635n | 1.18808 1.19921n | 1.20308 1.16495n
1.33519 1.22804n | 1.42206 1.43585n | 1.33254 1.16758n | 1.39183 1.42579n | 1.26752 1.27865n | 1.28302 1.24439n
+21.64 −16.91 | +26.43 −27.28 | +21.50 −14.71 | +24.65 −26.65 | +18.51 −19.00 | +19.19 −17.55
42 23.74 42 25.14 | 42 28.48 42 28.97 | 42 24.00 42 25.84 | 42 26.10 42 26.85 | 4× 2 28.41 42 28.50 | 42 28.19 42 27.85

+19 40 24.61 23.21 | 40 19.87 19.38 | 40 24.35 22.51 | 40 22.25 21.50 | 4× 0 19.94 40 19.85 | 40 20.16 18.50
23.91 | 19.62 | 23.43 | 21.87 | 19.89 | 19.33 ✓ ✓
+22 31 45 32 26 | | | | 31 53 32 30 |
1.37810 1.37830 | | | | 1.37820 1.37830 |
+405 | −1663 | −1303 | −1090 | −2776 | −1744
1.38215 1.38235 | 1.36147 1.36167 | 1.36507 1.36527 | 1.36720 1.36740 | 1.35044 1.35054 | 1.36076 1.36086
−24.11 −24.12 | −22.99 −23.00 | −23.18 −23.19 | −23.29 −23.30 | −22.41 −22.42 | −22.95 −22.96

−.06 +.05 −.03 | −.08 +.02 −.08 | −.05 +.17 −.02 | −.07 +.46 −.08 | −.04 +.40 −.04 | −.04 +.51 −.03
+.08 +.11 | +.08 +.12 | +.18 +.24 | +.44 +.64 | +.26 +.62 | +.48 +.62
−24.09 −24.04 | −22.99 −22.96 | −23.05 −22.97 | −22.92 −22.74 | −22.19 −21.84 | −22.51 −22.37
40 0.52 59.14 | 56.88 56.42 | 1.30 59.54 | 59.33 58.96 | 57.75 58.01 | 57.65 56.13
50 16.0 | 16.29 | 17.6 | 18.6 | 18.9 | 19.1
+10 15.6 16.9 | 20.0 20.5 | 16.3 18.1 | 19.3 19.8 | 21.2 20.9 | 21.5 23.0
+10 16.3 | 20.2 | 17.2 | 19.6 | 21.1 | 22.2
+10 15.52 50 21.14 | +19.69 18.91 20.89 | +17.58 16.83 22.53 | +19.00 18.33 21.06 | +19.86 17.23 20.08 | +21.42 22.48 121.36
− .80 14.72 −12.98 19.79 | − .78 −13.78 20.43 | − .75 −14.48 20.77 | − .67 −15.48 20.49 | − .63 −15.78 20.34 | − .61 −15.98 19.84
+ 5.90 | + 5.10 | + 4.40 | + 3.40 | + 3.10 | + 2.90
+10 20.62 50 20.47 | + 24.01 20.66 | + 21.23 21.65 | + 21.73 20.77 | + 22.33 20.21 | + 23.71 20.60
50 1.59 | 1.78 | 2.47 | 1.89 | 1.33 | 1.72

1875

June 9	9m	59s.69		49'	55.4"
14		59.65	-.04		55.9 +.5
19		59.61	.04		56.5 .6
24		59.57	.04		57.1 .6
29		59.53	.04		57.7 .6

1875 s

α ~~27.536~~ 57.595

δ ~~-24 12".13~~ +50 3".07

dα/dt + ~~3.126~~ +2.734

dδ/dt - ~~17".380~~ -18.883

l cos δ 9.97344

lb .12552

lb' .09896

1874.0 α	δ	1875.0 α	δ
54.89		57.57	
91		63	
93		65	
90		61	
90		62	
87		64	
54.900		57.620	
.861	21.95	.595	3.07
+.039		+.025	

1875

-.50
June 8
-.485

9 44.6	9 43.3
46.9	
49.0	
53.4	
55.5	
57.7	
0.0	
2.1	
6.4	
8.7	
10.9	
3352	
300	
635 2	9 43.30
9 57.745	
	+2.18
57.729	-.18
9 59.70	
-1.97	-2.11
	5762
+ 2.12	
- .17	
- 2.11	
- 0.16	6 238
9 57.73	-16 559
	-.9
9 57.57	+780
+19	50 369
+14.44	
15	
-1.96	
0 53.9	
13.7	
127.6	
16 3.80	
1.15957	
1.25853	
+1814	
16 21.94	
6 26.41	
-79	
1.37761	1.37751
-23.85	-23.85
-.03 ~~-.09~~	
-.15 -.18	
-2403	
6 2.38	
49 55.3	
-16 7.1	
-16 7.1	
-16 5.73	6.47
- .74	
+ 7.80	
-15 58.67	50 3.71

-.45
June 10
-.442

9 45.0	9 44.6
47.0	
49.2	
53.6	
55.7	
58.0	
0.2	16 21.0
2.4	22.9
6.8	24.4
8.8	
11.1	
3378	
300	
6378	9 44.60
9 57.982	10 22.77
	+1.91
57.966	-.16
9 59.68	
-1.71	-2.09
	5763
+ 1.91	
- .16	
- 2.09	
- 0.34	258
9 57.97	-16 7.14
	-.9
9 57.63	+760
	50 2.14
15 +13.38	-24.79
-1.94	
0 55.2	1 43.7
14.9	2.1
1301	1058
16 5.05	16 52.90
1.12646	1.39428 n
1.22542	1.49324
+16.80	-31.13
16 21.85	16 21.77
6 26.50	26.58
.26.54	
32 17	33 5
1.37830	1.37850
-413	
1.37417	1.37437
-23.67	-23.68
-.03 -.28	-.11
-.15	-.27
-23.85	-24.06
2.65	2.52
55.5	
7.1	7.0
7.1	
- 7.34	8.07 2.18
- .73	2.05
+ 7.60	
- 0.47	2.12

-.45
June 14
-.440

9 45.1	9 45.7
47.3	48.0
49.5	50.0
53.7	
55.9	
58.1	
0.4	10 24.0
2.5	26.0
7.0	28.9
9.1	
11.4	
3400	
300	
6400	9 47.90
9 58.182	10 26.30
	+1.71
58.166	-.16
9 59.65	
-1.48	-2.06
	5766
+ 1.70	
- .16	
- 2.06	
- 0.52	327
9 58.17	-16 7.14
	-.9
9 57.65	+720
	50 2.43
15 +10.28	-28.12
-1.91	
0 57.8	1 45.7
18.7	7.2
1365	1129
16 8.25	16 56.45
1.01199	1.44907 n
1.11095	1.54798
+12.91	-35.31
16 21.16	16 21.14
6 27.19	27.21
27.20	
-482	
1.37348	1.37368
-23.63	-23.64
-.02 -.29	-.14
-.15	-.27
-23.80	-24.05
3.35	3.16
55.9	
7.5	7.8
7.4	
- 7.28	8.00 2.59
- .72	2.36
+ 7.20	
- 0.80	2.47

-.44
June 15
-.453

9 45.2	10 22.3
47.4	24.9
49.7	27.5
54.0	
56.2	
58.4	
0.6	
2.8	
7.0	
9.4	
11.5	
3422	
300	
6422	10 24.90
9 58.382	
	+1.46
58.366	-.16
9 59.64	
-1.27	-2.05
	5762
+ 1.45	
- .16	
- 205	
- 0.76	043
9 58.37	-16 7.35
	-.9
9 57.61	+710
	50 49 59.28
15 -26.52	
-1.88	
0 52.8	1 49.6
14.8	5.2
1276	1148
16 3.80	16 57.40
1.42357 n	
1.52253 n	
-33.31	-33.31
16 ~~30.49~~	16 24.09
6 ~~17.86~~	6 24.26
-981	
1.36849	1.36869
-23.36	-23.37
-.12 -.32	-.12
-.20	-.34
-23.68	-23.83
	~~0.58~~
	0.43
56.0	
	4.6
	4.6?
- 6.72	7.43
- .71	
+ 7.10	
- 0.33	0.10

-.62
June 24
-.647

9 46.5	9 35.3
48.8	37.7
50.9	40.0
55.2	
57.4	
59.6	
1.8	10 15.8
4.0	17.9
8.4	20.3
10.7	
12.9	
3562	
300	
6562	9 37.67
9 59.655	10 18.00
	+0.17
59.639	-.22
9 59.57	
+0.07	-1.98
	57.61
+ 0.19	
- .23	
- 1.98	
- 2.02	440
9 59.64	-16 6.44
	-.9
9 57.62	+600
	50 3.06
15 +21.98	-18.25
-1.91	
0 41.8	1 32.7
5.5	55.0
1073	877
15 53.65	16 43.85
1.34208	1.26364 n
1.44099	1.36260 n
+27.60	-23.05
16 21.25	16 20.80
6 27.10	27.55
27.32	
-2396	
1.35434	1.35454
-22.61	-22.62
-.08 -.30	-.06
-.16	-.35
-22.85	-22.99
4.25	4.56
57.1	
7.1	7.5
7.3	
- 6.70	7.42 2.83
- .72	3.14
+ 6.00	
- 1.42	2.98

-.58
June 28
-.530

9 47.3	9 35.0
49.4	36.7
51.7	38.4
56.0	
58.2	
10 0.5	
2.6	10 20.0
4.8	22.3
9.2	23.9
11.4	
13.6	
3047	
300	
47	9 36.70
10 0.427	10 22.07
	-0.62
0.411	-.21
9 59.54	
+0.87	-1.95
	57.63
- 0.63	
- .19	
- 1.95	
- 2.77	555
10 0.41	-16 7.99
	-.9
9 57.64	+550
	50 2.16
15 +23.73	-21.64
-1.93	
0 37.9	1 35.1
2.0	58.3
999	934
15 49.95	16 46.70
1.37530	1.33526 n
1.47426	1.43422 n
+39.80	-27.18
16 19.75	16 19.52
6 28.60	28.83
28.71	
32 2	32 59
1.37820	1.37850
-1977	
1.35843	1.35873
-22.83	-22.84
-.10 -.32	-.09
-.14	-.32
-23.07	-23.25
5.53	5.58
57.6	
7.9	8.0
7.9	
- 8.05	8.78 2.25
- .73	2.30
+ 5.50	
- 3.28	2.27