1876phae.proj

KG
11366
v.477

B 1 1876-7

From 0h 2m 16s = 6h 9m

Fundamental Star

Charles W. Sever, University Bookstore, Cambridge.

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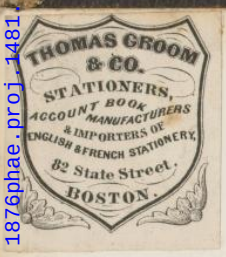

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Constants

1876	15 tan i
Jan 10 — May 1	0.12495
May 3 — July 23	0.12193
July 24 — Aug 5	0.12516
Aug. 6 1876 — Jan 4 1877	0.12236

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1 Andromedae

1876 $0^h\ 1^m\ 56^s$
$28^\circ\ 24'\ 1''$
13 3 58 47

α_0 1 58814
Corr^x + .03
$\frac{d\alpha}{dt}$ + 3.0879
δ_0 24 2088
Corr^d − 2
$\frac{d\delta}{dt}$ + 19.907

log cosδ 9.94431
15 constant 0.06624 May + June
0.06667 not Dec.
Long^g + 0.54 + 1.14
Corr^z + .24

log R 1.32697
R-2 20.946
R-2 21.236
I 2.34
I .142

1876 + −.31 May 3 + −.52 −.08 May 21 + −.59 −.07 −.08 May 24 + −.08 −.08 May 25 +

| h | m | s | m | s | m | s | | |

1876phae.proj.1481

	h	m	s	°	′
Apr 30	0	1	58.41 14	+28	24 16.8 5
May 5			58.65 14		17.3 5
10			58.69 14		17.9 6
15			58.84 15		18.6 7
20			58.99 15		19.3 7
25			59.15 16		20.1 8
30			59.32 17		21.0 9
June 4			59.49 17		22.0 10
9			59.67 18		23.1 11

-49

May 29

-39 -58 -08

May 30

× -482 -08

May 31

× -.50

June 5

| | | |

1876phae.proj.1481.

1876 + −.50 June 6 | −.81 −.19 Nov. 4 | −.72 Nov. 12 + | + −.69 Nov. 13

m	s
2	80
	9.7
	11.3
	29.0

m	s
2	10.4
	12.7
	15.1
	17.5
	19.8
	52.6
	54.9
	57.3
	59.6
	2.0
	30.19

m	s
2	22.0
	24.4
	26.7
	31.3
	33.7
	36.0
	38.4
	40.7
	43.1
	45.4
	47.8
	50.1
	39.64

Ch. J.

1	34.8	
	38.4	
	40.3	
	11.58	
1	38.60	

1	31.4	
	33.7	
	36.2	
	40.7	
	43.1	
	45.4	
	47.8	
	50.0	
	52.8	
	55.1	
	59.6	
	49.98	
1	13.23	

1	11.5	
	18.0	
	15.2	
	9.7	

1	19.3	
	21.6	
	24.0	
	26.3	
	28.6	
	—	
	—	
	—	
	—	
	—	

1	30.8	
	33.1	
	35.4	
	40.3	
	42.6	
	44.9	
	47.2	
	49.6	
	52.2	
	54.6	
	57.1	
	59.6	
	49.37	

2	36.190	36.036
		.048
2	36.042	
1	59.571	
+	36.47	
+	36.44	

1	45436	
1	45436	
2	2238	
−	1680	
−	1683	

1	44906	
1	44894	
2	2228	
−	1733	
−	1736	

−36.13 −.27 −.76 −.76 −37.16 1 58.88

−.44 −.11

+17.21 −.39 −.342 +13.40 58.84

+17.75 −.37 −.341 +13.57 58.86

−.27 −.44 −.11 −.39 −.37

E	F	+26.37			+ 6.84	+ 6.34	+31.66	+ 31.66	
G	H	1.42111			0.83506		1.50051		
		1.48735			0.90173		1.56718		
°	′		0	1	0	1	0	1	
″	″								
14.8	13.7		36	47	196	21.1	31.7	35.2	2.9	5.4	
21.7	19.6		7.2	54.7	24.4	11.6	33.8	21.0	5.9	8.25	
36.5	33.3		108	1194	440	327	64.5	56.2	8.8	11.79	
18.25	16.65		5.40	59.70	22.00	16.35	32.75	28.10	4.40	5.895	
′	″		′	″	′	″	′	″	′	″	
0	17.45		1	2.55	2	19.17	1	30.92	1	1.67	
+	30.71						+	7.98	+	36.91	
0	48.16						1	38.90	1	38.58	
28											
21	09.19						21	9.45	21	9.77	
13	57	43					57	38	57	09	
	1.15580						1.15580		1.15550		
	−423						+831		+936		
	1.15157						1.16411		1.16486		
	−14.18						−14.59		−14.62		
	− .15						− .01		− .22		
	− .07						− .34 .42		− .23		
	+ .01						+ .06		+ .04		
	−14.39						−14.96		−15.08		
28	21	45.80					20	54.49	20	54.69	
			+2	56.90		+3 56.32 −0.5	+3	56.90		+3 56.70
	24′	22.″5		−0.4			24	51.2	24	51.3	
	+2	36.7		−16			+3	56.7	+3	56.6	
		36.5	+2	54.90				56.5		56.4	
							+3	26.10		−0.5
										−30.4
									+3	25.80
28			+24	20.70			+24	20.59	+24	20.49

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1876phae.proj.14811

See first part of S. L.

	m	ℓ			′	″	
Nov 16	2	2.20			24	51.5	
21		2.15	5			51.8	3
26		2.10	5			52.0	2
Dec 1		2.05	5			52.1	1
6		1.99	6			52.2	1
11		1.93	6			52.2	0
16		1.87	6			52.1	1
21		1.81	6			51.9	2
26		1.74	7			51.6	3
1						51.2	4

| | | | | | |

1876phae_proj.1481.

B Cassiop.

α_1 2h 31s
δ_1 58° 27' 36"
α_0 16° 04' 48"

Cond $\frac{d\alpha}{dt}$ s +.01 +3.1656
δ_0 27 55'88" +.7 +19.850
Cond $\frac{d\delta}{dt}$

α_2 2h 34.219m

| | | |

1876phae.proj.1481

See first part of S. Book.

Pegasi

| | | |

1876phae.proj.1481.

Gr. 29 — 0 9 10 — +76° 15′ 21″ — 33° 52′ 33″

α_0 9 13.210 s — corr + .27 — $\frac{d\alpha}{dt}$ + 3.2820 s — δ_0 15 40.97 ″ — corr + .5 — $\frac{d\delta}{dt}$ + 20.018 ″

1876 — Nov. 12 — −.72 — Dec. 6 — −.59 — Jan 5 — −.39 — Dec. 23 — Dec. 27 — 1877 — Jan. 2 — −.40 — Jan. 4 — −.25

log cos δ 9.37549 — 15 constant 9.49785 — long δ + 4.09 + 4.22 — sin z − .556

log I 0.93880 — I 8.68 — ½ I 4.34

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i Leti

α 0 h 13 m 4 s

δ −9° 31′ 2″

+51° 53′ 50″

α_0	13	6.58	Dec 6	13	10.16	5	30	22.7	4										
Corr	s		11		10.11	5		23.1	4										
	+ .00		16		10.06	5		23.5	4										
	s		21		10.01	5		23.9	3										
$\frac{d\alpha}{dt}$	+3.0586		26		9.96			24.2											
	′	″																	
δ_0	30	42.20																	
Corr	+ .3																		
	″																		
$\frac{d\delta}{dt}$	14	49.90																	

1876	×		×			1877	×												
	−.53			−.39			−.40												
	Dec. 13			Dec. 23			Jan. 2												
0	12	0.8	12	8.3	12	9.9	1	—	11	25.6	11	34.4							
		2.4		10.5		11.9		—		27.9		36.6							
		4.6		12.5		14.0		—		29.8		38.7							
		7.8		16.7		35.8	12	—		33.3		42.8							
				18.8			389	1.8				44.9							
			12	37.0			400	4.0				47.0							
							3.81	5.9				49.1							
							82	8.0				51.3							
							94	12.3				53.3							
							95	14.4				57.5							
							86	16.4				59.6							
				23.00								51.72							
	12	2.60			12	11.93			11	27.77									
			12	20.709	12	37.0	12	38.96			11	47.018							
	+49.22		13	10.088	+1	6.05	13	9.988	+1	22.81	13	9.888							
	f.09			48.18		f.07		66.09		f.07		82.87							
				49.18				66.09				82.87							
	−3.50				−3.40				−3.30										
	+45.81				+2.72				+19.58										
+13	6.72				+6.62				+6.60										
				+.09				+.07				+.07							
				+18.31		−8.03		−33.10		+19.25		+19.25							
ℰ	F			1.26269		0.90472n		1.51983n		1.28443									
ℊ	N			1.37903		1.02106n		1.63617n		1.40077									
	′																		
13	0				33		33		33	0									
″	″																		
35.4	35.3				66	5.9	36.1	35.4	31.6	31.0									
30.1	15.1				0.8	44.2	30.6	18.5	27.2	10.5									
65.5	50.6				7.4	1101	66.7	43.9	58.8	41.5									
32.8	25.30				3.70	55.05	33.35	21.95	29.40	20.75									
							56	30.15											
55	29.03				55	57.37	56	27.65	55	25.07									
	+23.74		+	23.94		−10.50	—	43.47	+	25.16									
55	52.97				55	48.87		46.88	55	50.23									
−9	33	4.61			33	0.52	32	58.53	33	1.88									
51	51	36			52	6	52	37	51	32									
	1.86452				1.86460		1.86480		1.86450										
	+917				+2954		+2954		+2702										
	1.87369				1.89414		1.89434		1.89152										
	−74.26				−78.37		−78.40		−77.20										
	+ .03				+ .01		+ .10		+ .03										
	− .38				− .32		− .48		− .12										
	+ .02				+ .02		+ .06		+ .02										
	−1 14.87				−1 18.66		−1 18.72		−1 17.97										
−9	34	19.48			34	19.18	34	17.25	34	19.85									
			+3	57.51	34	18.22	+3	56.58			+3	56.74							
−	30	23.83		−1.7	−30	24.0		−1.6	−30	24.6		−2.1							
	+3	56.2		−1.9	+3	54.2		−1.8	+3	55.3		−1.6							
		56.5	+3	54.61		54.5	+3	36.78		55.6	+3	27.04							
			3	36.91															
−9			−30	52.57			−30	41.44			−30	52.81							
				43.57															

Log cos δ 9.99398

1.5 cos δ tan i 0.11634 I 209

Long δ − 0.17 + 1.01

sin z + .79

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κ Cassiop.

α 0h 25m 54s.858

δ +62° 14' 30"

Jan 1 6 11 16 21

Dec 6 11 16 21 26 31

Jan. 10 | Nov. 13 | Dec. 6 | Dec. 13 | Jan. 2 | Jan. 4

log cos δ 9.66803

15 Cos δ tan α 9.79298 9.79039

Jan. 1876 Nov. Dec. Jan. 77

log I 0.64626

I 443

Long'd sin z + 1.90 .34

Oct. 27 Nov 1 6 11 16

+2.14

1877

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κ Draconis
12 28 8
+70° 28′ 38″

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γ Cassiop.

0h 30m 1s
+53° 12' 30"
+10° 49' 42"

α_0 30m 4.290s
Corr^n + .00s
$\frac{d\alpha}{dt}$ + 3.3104s
δ_0 12° 50' 7"
Corr^n + .08" .8
$\frac{d\delta}{dt}$ + 19.861"

Dec 6 11 16 21 26 31

30m 7.71 7.65 7.55 7.42 7.26 — 6 10 13 16

13s 2.76 2.80 2.83 2.85 2.86 2.86 — 4 3 2 1 0 1

log cos δ 9.77728
15 cos δ tan i 9.89964
Corr^n + 1.34 + 1.67
sin z − .19

1876 + −.59 Dec. 6 | −.53 + Dec. 13 | 1877 −.40 + Jan. 2 | −.25 Jan. 4

h	m	s	m	s	m	s	m	s	m	s	m	s	m	s
0	29	29	29	7.8	28	52.8	28	58.3	28	10.5	28	24.0	28	24.5	28	20.8
		6.3		11.4		34.9		1.7		12.6		27.5		26.8		24.3
		8.9	2.	14.8		37.5		5.1		15.9		30.8		29.8		27.8
		9.8		21.7		45.2		12.0		9.0		37.8		21.1		34.6
		27.9		25.0				15.6				41.4				38.1
	29	56.9		28.4	29	46.4		19.0	29	22.0		44.7	29	7.6		41.5
		1.8		31.9		48.1		22.5		25.2		48.1		11.0		45.0
		3.8		35.2		52.4		25.9		29.4		51.7		18.6		48.3
		18.25		42.3		14.69		32.9		16.6		58.5				55.4
				45.8				36.2				2.0				58.7
				49.2				39.7				5.4				2.2
				31.35				26.84				37.19				8.967
	29	6.98			28	55.07		30.86	28	13.00		49.19	28	27.03		45.67
	30	0.83	29	28.500	29	48.47	29	18.991	29	25.53	28	44.718	29	9.30 12.40	28	41.518
		+39.92	30	7.707		+49.23	30	7.685 +1		22.83	30	6.999 +1		25.77	30	6.927
		−.79		−39.21		−.71		−48.61		−.54		−82.28		−.34		−85.41
				−39.21		.8		−48.61				−82.28				−85.41
		−3.42				−3.32				−2.71				−2.64		
		+35.71				+45.20				+19.58				+22.79		
	+30	4.21				+ 4.19				+ 4.30				+ 4.31		
		+21.52		−.79				−.71				−.54				−.34
		1.33284														
		1.23248														
				−3233		+23.92		−29.98		+31.72		−40.81		+14.49		−30.48 −27.78
		ϵ_0		1.50961m		1.37876		1.47683m		1.50133		1.61077m		1.16104		1.48401m
		η_0		1.40925m		1.27840		1.37647m		1.40097		1.51041m		1.06071		1.34337m 1.38365m
			10	3	10	3	10	3	10	3	10	4	10	3	10	3
			10.3	162	33.9	6.18	10.3	17.5	57.0	1.2	1.4	11.1	2.6	8.8	19.7	25.1	5.44	0.3
			11.4	50.9	33.4	37.6	10.4	42.6	52.9	36.0	5.0	43.1	0.8	43.4	18.6	36.4	5.44	35.3
			21.7	12.71	111.3	99.1	20.7	127.1	106.9	97.2	10.4	114.2	3.4	112.2	38.3	141.5	11.18	95.6
			10.85	3.55	55.65	49.70	10.35	3.55	53.45	48.60	5.20	57.10	1.70	56.10	19.15	10.75	55.90	47.80
			13	7.20	13	52.67	13	6.95	13	51.02	13	1.15	13	58.90	13	14.95	13	51.85
			+	17.08	−	25.66	+	18.98	−	23.80	+	25.17	−	32.39	+	11.50	−	22.25 24.19
			13	24.28		27.01	13	25.93		27.22	13	26.32		26.51	13	26.45		29.80 27.66
	53	9	24.07		21.34	9	22.42		21.13	9	22.03		21.84	9	21.90		18.55	20.69
	−10	50	46	50	00	50	46	50	02	50	52	49	54	50	38	50	1
				1.04268		1.04220		1.04268		1.04220		1.04274		1.04274 13		1.04256		1.04220
				+1616		+1616		+931		+931		+2784		+2734		+3567		+3567
				1.05884		1.05836		1.05199		1.05151		1.07008		1.06947		1.07823		1.07787
				+11.45		+11.44		+11.27		+11.26		+11.75		+11.73		+11.97		+11.96
				− .12		− .27		− .15		− .24		− .26		− .43		− .08		− .24
				− .93		− 1.17		− .96		− 1.18		− .90		− 1.20		− .96		− 1.18
				+ .12		+ .16		+ .12		+ .15		+ .12		+ .16		+ .13		+ .15
				+10.52		+10.16		+10.28		+9.99		+10.71		+10.26		+11.09		+10.69
	+ 52	9	34.59	9	31.50	9	32.70		31.12	9	32.74		32.10	9	32.99		31.38	
		9	33.04			9	31.91	+3	57.51	9	32.42	+3	56.74		32.18	+3	56.72	
		13	27.6	13	27.6	13	28.1		+44	13	28.6		+0.5	13	28.5		+0.5	
				+3	56.1	+3	56.2		−38.0	+3	56.2		−38.6	+3	56.3		−38.4	
					56.9		57.0	+3	19.91		57.0	+3	18.74		57.1	+3	18.82	
				+3	56.84													
	53				+04			+12	51.82			+12	51.16			+12	51.00	
					−37.5													
				+3	19.74													
				+12	52.78													

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1876phae.proj.1481

α Cassiop.

$0^h\ 33^m\ 25^s$

$+55°\ 51'\ 5''$

$-13°\ 28'\ 17''$

α_0 33 28.83 — Jan 1 — 83 27.91 — 14 — 51 41.4 — 1

Corr: +.00 −.01 — 6 — 11 — 24.76 — 14 — 41.3 — 3

$\frac{d\alpha}{dt}$ +3.3648 — 11 — 16 — 27.62 — 13 — 41.0 — 4

16 — 21 — 27.49 — 13 — 40.6 — 5

21 — 26 — 27.36 — 13 — 40.1

δ_0 57 24.31

Corr: −.03 +.07 — Dec 6 — 11 — 33 32.31 — 11 — 52 22.4 — 4

$\frac{d\delta}{dt}$ +19.785 — 11 — 16 — 32.20 — 12 — 26.4 — 4

16 — 21 — 32.08 — 12 — 30.0 — 2

21 — 26 — 31.95 — 13 — 32.2 — 2

26 — 31 — 31.82 — 13 — 34.4 — 2

31 — 1 — 31.69 — 13 — 36.5 — 1

1876 — 1877

log cos δ 9.74924

15 cos δ sin 1 9.87419 Jan 1876

9.87160 Dec 76 Jan 77

tang δ +1.48 +1.78

sin z −.23

		−.04			−.59													−.25	
+	Jan 10			Dec. 6			×	Dec. 13				Jan 2			×		Jan. 4		
	32 46.7		32 50.8		32 20.0		32 31.2		31 59.7		32 21.6		31 32.0		31 47.4		31 36.3		31 44.0
	49.6		54.4		22.0		34.8		2.0		25.3		35.0		51.0		38.7		47.3
	53.0		58.0		25.8		38.4		5.4		29.1		38.1		55.6		43.4		51.6
	1493		56		78		45.9		187.1		36.4		151		2.0		118.4		58.7
			9.1				48.7				40.0				5.8				2.6
	33 49.0		12.7		33 20.6		53.3		33 14.3		43.8		32 25.3		9.5		32 52.7		6.2
	37.5		16.4		24.3		57.0		18.4		47.4		28.3		13.0		56.4		9.9
	46.3		20.1		27.5		0.7		2.07		51.1		32.0		16.8		1.0		13.6
	1568		27.6		12.4		7.9		534		585		856		24.2		1701		21.0
			31.2				11.7				2.0				27.9				24.5
			35.0				15.3				5.7				31.5				28.2
			32.09				24.59				36.09				28.37				30.83
	32 49.77		14.09		32 22.60		58.56		32 2.37		48.04		31 35.03		10.37		31 39.47		6.83
	33 52.27		33 12.809		33 24.13		32 53.264		33 17.80		32 43.718		32 28.53		32 9.427		32 56.70		32 6.209
	+14.90		33 27.641		+39.92		33 32.305		+49.23		33 32.146		+1 22.83		33 31.617		+1 25.78		33 31.561
	−.06		− 14.83		−.87		− 39.04		−.78		− 48.43		−.59		− 82.19		−.37		− 85.35
	r		− 14.84 2				− 39.93 3				− 48.49 2				− 82.28 18				− 85.38 4
	+ 1.189				− 3.47				− 3.32				− 2.79				− 2.73		
	+ 16.03				+35.58				+45.13				+19.45				+22.68		
	+33 28.84				+28.84				+28.185				+28.88				+28.89		
	+23.04		−.06				−.87				−.78				−.59				−.37
	1.36248																		
	1.23647																		
			−39.46		+30.66		−30.87		+41.35		−34.08		+31.40		−19.10		+26.74		−5.49
ℰ	ℱ		1.59616 m		1.48657 m		1.48954 m		1.61648		1.53250 m		1.53656		1.28703 m		1.42716		1.70321 m
ℊ	ℌ		1.47035 m		1.35817		1.36114 m		1.48808		1.40410 m		1.40816		1.15263 m		1.29876		1.57481 m
	30 3		30 3		30 4		35 6		30 4		35 0		30 4		35 0		30 4		35 0
	2.9	9.5	50.9	55.7	35.9	40.9	22.5	27.3	27.2	33.9	23.7	30.4	32.1	38.3	13.6	18.8	87.4	43.0	36.8	40.8
	7.1	56.3	538	45.3	33.9	154	22.9	38	26.8	44	24.7	53	31.9	44	12.4	546	36.5	149	36.4	152
	100	1258	1047	1010	718	563	484	311	540	388	484	357	640	480	260	1334	739	579	732	560
	5.00	2.90	52.35	50.50	35.90	28.15	22.70	15.58	27.00	19.40	24.20	17.86	32.00	24.00	13.00	6.70	36.95	28.95	36.60	28.00
	33	3.95	33	51.42	34	32.02	35	19.16	34	23.20	35	21.02	34	28.00	35	9.85	34	32.95	35	32.30
	+ 17.24		− 29.54		+ 22.81		− 22.97		+ 30.77		− 25.36		+ 25.60		− 14.21		+ 19.90		− 37.57	
	33 21.19		21.88		34 54.83		56.15		34 53.97		55.66		34 53.60		55.64		34 52.85		54.73	
55	49 27.14		26.47		47 54.52		52.20		47 54.38		52.69		47 54.75		52.71		47 55.50		53.42	
−13	29 02		28 15		29 21		28 34		29 30		28 32		29 25		28 43		29 20		28 21	
	1.14010		1.18962		1.14025		1.18986		1.14035		1.13980		1.14080		1.13992		1.14025		1.18968	
	+1423		+1423		+1620		+1620		+933		+883		+2789		+2739		+3572		+3572	
	1.15433		1.15385		1.15645		1.15606		1.14968		1.14913		1.16769		1.16731		1.17597		1.17540	
	+14.27		+14.25		+14.34		+14.32		+14.12		+14.10		+14.71		+14.70		+14.88		+14.98	
	− .13		− .89		− .24		− .24		− .43		− .29		− .30		− .09		− .18		− .64	
	− 2.82		− .27		− 1.35		− .09		− 1.36		− .09		− 1.35		− .06		− 1.35		− .15	
	+ 13.12		+ 13.15		+ 12.18		+ 12.01		+ 12.18		+ 12.01		+ 12.18		+ 12.01		+ 12.18		+ 12.02	
	+14.04		+13.74		+12.93		+14.00		+12.51		+13.73		+13.24		+14.56		+13.65		+14.21	
+ 55	49 41.20		40.21		48 6.45		6.20		48 6.89		6.42		48 7.99		7.27		48 9.15		7.83	
	49 40.70		+ 2 2.37		48 6.32		+ 3 5.684		48 6.66		+ 3 5.751		48 7.63		+ 3 5.674		48 8.49		+ 3 5.672	
	51 41.0		+ 0.3		52 2.2		+ 0.5		52 2.8		+ 0.4		52 3.5		+ 0.6		52 3.6		+ 0.6	
	+ 2 0.3		+ 16.7		+ 3 55.9		+ 37.9		+ 3 56.1		+ 38.5		+ 3 55.9		+ 39.2		+ 3 55.1		+ 39.3	
	1.0		+ 1 45.97		56.6		+ 3 19.44		56.8		+ 3 19.41		56.6		+ 3 18.14		55.8		+ 3 18.02	
55			+51 26.67				+51 25.76				+51 26.07				+51 25.77				+51 26.51	

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β Ceti.

h m s
0 37 18

° ′ ″
−18 40 24

+61° 03′ 12″

	m	s
2°	37	21.820
dα/dt	+ 3.013	
δ₀	40	2.74
dδ/dt	+ 19.82	

	m	s
1876 Jan 10	37	21.87
Dec 4		25.61
9		25.56
14		25.51
19		25.46
24		25.40
29		25.34
1877 Jan 4		25.28

	″		
	40	9.8	
	39	45.3	
− 5		45.8	5
5		46.3	5
5		46.7	4
6		47.1	4
6		47.4	3
6		47.6	2

log cos δ 9.97653
15 cos δ tan i 0.10148 Jan. 1876
0.09889 Dec. 76 Jan 77 218
Lang δ − 0.34 + 1.06
sin z + .88

1876 −.04 Jan 10
−.59 Dec. 6
−.46 Dec. 10
−.53 Dec. 13
1877 −.40 Jan. 2
−.25 Jan. 4

	m	s																		
37	11.7	37	—	36	12.9	36	824	36	156	36	278	36	18.9	36	23.1	35	38.4	35	49.3	36	18.0	35	—
	13.0		—		14.3		84.7		17.0		29.8		21.8		25.4		40.4		51.6		11.5		—
	14.6		—		15.9		86.8		18.3		32.0		23.7		27.4		42.0		52.6		14.0		—
	39.3	696	2.6		13.1		41.3		20.9		86.5		54		81.8		12.08		58.0		55		—
		.88	4.7				434				88.8				84.0				0.3				—
37	49.0	.80	6.8	37	4.8		45.6	37	09		41.0	37	5.7		36.3	36	28.7		2.4			59.40	57.4
		.92	9.1		6.5		47.7		3.7		43.1		7.9		38.4		30.4		4.6			.32	1.5
		.84	11.2		8.6		49.9		6.0		45.0		9.6		40.6		32.5		6.4			.34	3.7
		.88	15.6		19.9		54.2		10.6		49.5		23.2		45.0		9.16		11.1			.28	8.0
		.80	17.7				56.5				51.7				47.1				18.2			.40	10.3
		.62	19.8				58.7				53.7				49.2				15.4			.32	12.5
							5012				4489				3983				2663				
37	13.10			36	14.37			36	16.97			36	21.80			35	40.27		26.2	36	11.833		
37	49.00	37	6.838	37	6.63	36	45.564	37	3.53	36	40.809	37	7.73	36	36.207	36	30.53	36	23.82			35.	59.343
	+14.90	37	21.87		+39.93	37	25.59		+44.07	37	25.55		+49.23	37	25.52	+1	22.84	37	25.30	+1	25.79	37	25.28
	+.01				+.20				+.16				+.18				+.13				+.08		
	−.05				− 3.77				− 3.73				− 3.70				− 3.48				− 3.46		
	+ 14.86				+ 36.36				+ 41.10				+ 45.71			+1	19.46			+1	22.41		
37	21.70				21.92				21.91				21.92				21.87				21.75		
	−6.26		+.01				+.20				+.16				+.18				+.13				+.08
	0.79657n																						
	0.89885n																						
			−42.16		+31.19		−21.07		+23.84		−22.72		+14.41		−31.52		+22.11		−28.15		−12.49		
ℰ	ℱ		1.62490n		1.49402		1.32366n		1.37731		1.35641n		1.15816		1.49859n		1.34459		1.44948n		1.09656n		
9	86		1.72638n		1.59291		~~1.39033n~~ 1.42255n		~~1.44398~~ 1.47620		~~1.42308n~~ 1.45530n		~~1.22603~~ 1.25725		1.59748n		1.44348		1.54837n		1.19545n		
		0	3	0	4	0	4	5	0	0	4	5	0	0	4	5	0	0	4	5	0	0	4
18.2	19.4	3.6	2.7	7.4	7.3	12.4	12.9	8.2	8.1	8.1	7.4	31.0	31.4	29.9	30.7	17.0	18.2	20.8	21.6	58.4	57.1
18.2	—	1.2	26	2.3	52.1	7.9	58.2	3.2	49.7	0.8	48.0	25.7	13.9	25.0	16.8	11.5	58.9	15.2	3.7	54.1	38.1
		48	13	9.7	11.94	20.3	13.11	12.4	11.90	8.9	11.54	56.7	45.3	54.9	47.5	28.5	13.71	36.0	25.3	11.25	9.82
18.20		2.40	265	2.85	59.70	10.15	5.56	6.20	59.50	4.45	57.70	28.35	22.65	27.45	23.75	14.25	8.55	18.00	12.65	56.25	49.10
		′	″	′	2.2″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″	′	″
		4	25.9	4	1.77	5	7.85	4	2.83	5	1.07	4	25.50	5	25.60	4	11.40	5	15.32	4	52.67		
	− 7.91	—	53.26	+	39.17	—	26.46	+	29.94	—	28.53	+	18.08	—	39.54	+	27.76	—	35.35	—	15.68		
		3	9.26	4	41.44		41.39	4	32.79	4	32.54	4	43.58		46.02	4	39.16		39.97	4	36.99		
		19	~~37.09~~	41	53.09		53.04	41	44.41		44.19	41	55.23		57.67	41	50.81		51.62	41	48.64		
−18		40	20.91																				
+61		1	57	0	9	1	15	0	10	1	8	0	33	1	33	0	18	1	22	1	00		
		2.01550		2.01494		2.01529		2.01409		2.01526		2.01611		2.01641		2.01602		2.01585		2.01523		
		+1434		+1434		+1624		+ 4795		+ 4795		+937		+937		+2750		+2750		+3578		
		2.02984		+1624		2.03153		2.06294		2.06321		2.02448		2.02478		2.04252		2.04285		2.05101		
				2.03120																			
				−107.11		−107.46		−107.53		− 115.59		−11566		−105.80		−105.87		−110.29		−110.37		−112.41
		+	.29	+	.16	+	.07	+	.08	+	.09	+	.03	+	.16	+	.08	+	.13	+	.03		
		−	.28	−	~~.28~~ 1.20	−	.03	−	1.20	−	.00	−	1.36	−	.12	−	1.26	−	.06	−	1.47		
		+	.16	+	.16	+	.00	+	.16	+	.00	+	.38	+	.02	+	.17	+	.01	+	.20		
		−1	46.94	−1	48.33	−1	47.49	−1	56.55	−1	55.57	−1	46.95	−1	45.81	−1	51.30	−1	50.29	−1	53.70		
	− 18	42	7.85	43	41.42		40.53	43	40.99		39.76	43	42.18		43.48	43	42.11		41.91	43	42.34		
	+2 2.37	42	7.85	43	40.98	+3	56.84	43	40.38	+3	57.23	43	42.83	+3	57.51	43	42.01	+3	56.74			+3	56.72
	− 1.7	40	9.8	39	45.5		−1.8	39	45.9		−1.8	39	46.2		−1.8	39	47.5		−2.3	39	47.6		−2.3
	+ 7.1						17.2				− 16.8				− 16.5				− 15.2				− 15.1
	+2 7.77					+3	37.84			+3	38.63			+3	39.21			+3	39.24			+3	39.32
−18	40 0.88					40	3.14			40	1.75			40	3.62			40	2.77			40	3.02

° ′ ″
−18 40 2.15 1876
40 2.90 1877

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η Cassiop.

α 0 41 26

δ +57 9 30

λ −14 46 42

dα/dt +3.582

dλ/dt +19240

dδ/dt +.10

Corr +.16

Corr 9 266.7

log cos δ 9.73435

15 cos δ tan i 9.85671

Long + 1.55 +1.88

sin z − .26

log I 0.57994

I 3.80

½ 1.90

1876 −.04 + Jan. 10

−.59 Dec. 6 +

−.46 Dec. 10 +

−.53 Dec. 13 +

−.41 Dec. 19 +

1877 −.40 Jan. 2 +

Lat. J. 0

| | | |

1876phae.proj.1481.

γ Cassiop.

| | | |

1876phae.proj.1481

ε Piscium λ₀

0h 56m 27s Conv + 01

+7° 13′ 0″ dz/dt +3.1088

+35 9 48 δ₀ 13 19.09

Cons + .4

dδ/dt +19.478

m s 56 30.522

	m	s				
Dec 6	56	34.22	4	13	45.1	2
11		39.18	4		44.9	3
16		34.14	4		44.6	3
21		34.10	5		44.3	3
26		34.05			44.0	4
31					43.6	4

log cos δ 9.99655

15 cos δ sin t 0.11891

I 2.08

lang δ +0.13 +1.01

sin z +.58

1876

	Dec. 6	Dec. 10	Dec. 13	1877 Jan. 2	Jan. 4
	−.59	−.46	−.53	−.40	−.25
0	55 28.0	55 41.9	55 24.4	55 37.3	55 21.9	55 34.3	54 54.3	55 7.6	55 32.4	54 53.8
	30.0	43.9	26.9	39.2	24.7	34.7	56.6	6.7		57.8
	31.7	46.8	28.3	41.3	25.0	36.6	58.3	2.8		59.8
	89.7	50.2	19.6	45.4	10.3	40.8	19.2	7.0		3.9
		52.3		47.5		43.0		7.1		6.0
56	12.2	54.1	56 18.8	49.6	56 7.0	45.0	55 34.3	11.3		8.2
	14.0	56.5	23.0	57.6	9.1	47.0	36.2	18.2		10.2
	15.8	58.6	25.0	53.6	10.7	49.2	38.0	15.3		12.3
	12.0	2.7	67.8	57.8	26.8	53.3	18.5	19.5		16.5
		4.9		0.0		53.4		21.6		18.7
		6.8		2.0		57.5		23.6		20.7
		4181		4253		4950		18.27		2698
	55 29.90	5981	55 24.53	5453	55 23.43		54 56.40	1227	55 32.40	898
	56 14.00	55 54.373	56 22.60	55 49.573	56 8.93	55 45.000	55 36.17	55 11.155		55 8.164
	+39.95	56 34.218	+44.869	56 34.186	+49.24	56 34.162	+1 22.86	56 33.978	+1 25.82	56 33.958
	−.08	− 39.84	−.06	− 44.61	−.07	− 49.16	−.05	− 82.82	−.03	− 85.79
		− 39.85		− 44.62		− 49.17		− 82.83		− 85.80
	−3.70		−3.66		−3.64		−3.46		−3.44	
	+36.17		+40.97		+45.53		+19.35		+22.35	
+86	30.54		+30.54		+30.53		+30.51		+30.51	
56										
	+2447	−.08		−.06		−.07		−.05		−.03
	1.38863									
	1.50754									
		−19.63	+23.04	−33.03	+21.57	−23.93	+14.76	−25.01	−21.24	−24.24
ε	1.292922	1.41183n	1.36248	1.51891n	1.33385	1.37894n	1.16909	1.39811n	1.38453n	
4	76	1.48139	1.63782n	1.45276	1.49785n	1.28800	1.31702n	1.50344n		
	10 1	10 2	10 1	10 3	10 1	10 2	10 2	16 2	10 2	10 2
	47.5 44.0	45.6 47.6	47.1 37.4	0.3 2.0	53.2 57.6	53.0 56.8	0.6 4.8	52.4 53.7	0.1 4.2	56.4 58.9
	43.0 33.1	41.3 32.2	43.9 29.4	53.6 40.7	50.4 37.7	48.7 39.2	57.9 44.7	48.2 37.7	58.9 42.8	57.8 40.4
	9.25 83.1	8.69 7.98	9.10 7.98	11.89 10.29	10.86 9.53	10.17 9.60	11.85 10.95	10.06 9.34	11.90 10.70	10.82 9.93
	46.25 41.55	43.45 39.90	45.50 39.90	57.98 51.45	51.80 47.65	50.85 48.00	59.25 54.75	50.30 46.70	59.50 53.50	54.10 49.65
	11 43.90	12 41.67	11 42.70	12 51.70	11 49.72	12 49.42	11 57.00	12 48.50	11 56.52	12 51.87
	+ 32.17	− 25.81	+ 30.29	− 43.43	+ 28.36	− 31.47	+ 19.41	− 32.89	− 31.57	− 31.87
	12 16.67	15.86	12 12.99	11.27	12 18.23	17.95	12 16.41	15.61	12 28.37	12 20.02
+7	10 32.28	32.49	10 35.36	37.08	10 30.12	30.40	10 31.94	32.74	10 19.94	10 28.35
+35	7 51	8 49	7 50	9 02	7 57	8 56	8 04	8 56		8 57
	1.60736	1.60764	1.60736	1.60770	1.60740	1.60767	1.60743	1.60767		1.60770
	+1651	+1651	+4835	+4885	+952	+952	+2782	+2782		+3607
	1.62387	1.62415	1.65585	1.65619	1.61692	1.61719	1.63525	1.63549		1.64377
	−42.06	−42.09	−45.27	−45.31	−41.89	−41.42	−43.18	−43.20		−44.08
	− .04	− .03	− .03	− .07	− .03	− .04	− .01	− .04		− .04
	− .51	− .81	− .53	− .90	− .56	− .87	− .58	− .64		− .84
	+ .07	+ .11	+ .07	+ .12	+ .07	+ .11	+ .08	+ .11		+ .11
	−42.54	−42.82	−45.76	−46.16	−41.91	−42.22	−43.68	−43.97		−44.80
+7	9 49.74	49.67	9 49.60	50.92	9 48.21	48.18	9 48.26	48.47		9 43.55
	9 49.70	+3 56.84	9 50.26	+3 57.23	9 48.20	+3 57.51	9 48.52	+3 56.74		+3 56.72
	13 45.1	−1.2	13 44.7	−1.2	13 45.0	−1.2	13 43.4	−1.5		13 43.8 −1.5
	+3 55.4	−26.0	+3 54.6	−25.8	+3 56.8	−25.9	+3 54.9	−24.3		+3 59.7 −24.2
	55.8	+3 29.64	55.0	+3 30.23	57.2	+3 30.41	55.3	+3 30.44		+4 30.1 +3 31.02
7		+13 19.34		+13 20.59		+13 18.61		+13 19.46		+13 14.57

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β Andromedae

| | | |

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θ Cassiop.

α 1 m 3 28

δ +54° 29'

−12° 06'

log cos δ 9.76413 log I 0.55016

15 cos δ tan i 9.88649 I 3.55

Long δ +1.40 +1.72

sin z −.21

1876 1877

	Dec. 6	Dec. 10	Dec. 13	Dec. 23	Jan. 2
	−.59	−.46	−.53	−.39	−.40
	1 8 15 / 5.0 / 9.5 / 16.0	2 493 / 52.9 / 56.4 / 8.6	2 47.0 / 48.5 / 50.0 / 51.7	2 36.0 / 38.9 / 41.5 / 116.4	2 42.0 / 43.8 / 45.6 / 47.4	2 53.8 / 56.5 / 0.4 / 170.7	2 6.5 / 8.9 / 12.6 / 28.0	2 7.7 / 9.6 / 11.5 / 18.0
	3 48.3 / 57.6 / 58.6 / 45	58.55 33.0 / .50 58.5 / .45 2.0 / .70 5.8 / .80 13.0 / .75 16.5 / .70 20.0	53.8 / 53.5 / 57.3 / 59.0 / 0.8	3 14.6 / 17.0 / 20.9 / 52.5	4.90 / 51.0 / 52.6 / 54.4 / 56.2	3 28.1 / 82.0 / 35.0 / 95.1	32.00 46.2 / 31.95 49.7 / 32.10 53.4 / 2 51.6 / 55.0 / 58.0 / 146	15.0 / 16.8 / 18.5 / 20.2 / 22.0
	3 5.33	2 52.87	4236 / 4836 / 2 38.80	4420 / 2 56.90	2 9.33	1343
	3 51.50	2 58.636	2 53.733	3 17.50	2 49.111	3 31.70	2 32.017	2 54.87	2 14.922
		+39.95 −.83	+44.70 −.64	+47.24 −.74	+1 6.11 −.55	+1 22.87 −.56
		−*8.99 +42.11 +3.513 3 41.75 33.77	−*3.92 +47.98 +4.014 3 41.71 33.87	−* 3.86 +52.36 4464 3 41.47 33.75	−* 3.64 +1 9.20 1.192 3 41.22 33.94	+ 0.18 +1 22.17 22.49 3 37.65 37.41
	−6.69 0.852543n 0.71192n	−.83	−.64	−.74	−.55	−.56
		−52.86 +0.86	+10.31 −28.39 −24.88	−59.68 +5.59 −39.95
	6 57 1.72313n 0.09345	1.01326 1.45317n 1.39585n	1.77583n 0.74741 1.60152n
	9 76 1.60962n 9.90450 9.82099	0.89975 1.33966n 1.28238n	1.66232n 0.63390 1.48801n
	53 2	53 2	53 1	53 2	53 2	53 1	53 2
	7.2 12.4	40.3 46.3	3.0 6.2	51.8 54.4	21.4 28.8	17.1 24.9	43.8 50.2	55.5 2.1	24.9 35.3
	7.4 47.1	3.93 22.1	0.2 39.2	52.1 30.9	20.0 2.9	17.9 53.9	43.2 25.2	55.9 32.3	28.1 10.0
	14.6 119.5	8.02 68.4	3.2 105.4	104.0 89.4	41.4 31.7	35.0 140.8	87.0 75.4	111.4 94.4	58.0 45.3
	7.30 59.75	40.10 34.20	1.60 52.70	52.00 44.70	20.70 15.85	17.50 10.40	43.50 37.70	55.70 47.20	29.00 22.65
	57 3.52	57 37.15	56 57.15	56 48.35	57 18.27	57 13.25	57 40.60	56 51.45	57 25.82
	− 5.75	− 40.70	+ 0.86	+ 7.93	− 2.86	− 19.16	− 45.95	+ 4.30	− 30.76
	56 58.37	56.45	56 57.81	56 56.28	56.41	56 54.79	54.65	56 55.75	55.06
+54	35 49.98	51.90	35 50.54	35 52.07	35 51.94	35 53.56	53.70	35 52.60	53.29
−12	6 49	6 16	6 56	7 05	6 35	6 39	6 12	7 02	6 27
	1.09200	1.09160	1.09205	1.09215	1.09185	1.09185	1.09160	1.09210	1.09180
	+ 1659	+ 1659	+ 4867	+ 955	+ 955	+ 2878 +3151	+ 2878 +3151	+ 2687 +2792	+ 2687 +2792
	1.10859	1.10819	1.14072	1.10170	1.10140	1.12336	1.12311	1.12002	1.11972
	+ 12.84	+ 12.83	+ 13.83	+ 12.64	+ 12.63	+ 13.28	+ 13.28	+ 13.18	+ 13.17
	− .02	− .71	− .00	− .03	− .21	− .16	− .91	− .02	− .41
	− .60	− .78	− .57	− .56	− .71	− .70	− .86	− .54	− .72
	+ .08	+ .10	+ .08	+ .07	+ .09	+ .09	+ .11	+ .07	+ .10
Σ	+ 12.30	+ 11.44	+ 13.34	+ 12.12	+ 11.80	+ 12.51	+ 11.82	+ 12.69	+ 12.14
54	26 2.28	3.34	26 3.88	26 4.19	3.74	26 6.07	5.32	26 5.29	5.43
	26 2.81	+3 56.84 +0.4 −37.2 +3 20.07	+3 57.23 +0.4 −37.8 +3 19.83	26 3.96	+3 57.51 +0.4 −38.1 +3 19.81	26 5.96	+3 56.58 +0.4 −38.9 +3 18.08	26 5.36	+3 56.79 +0.6 −21.0 +3 36.34
		+54 29 22.85	29 23.71		29 23.79		29 23.04		29 41.70

+54 29 23.53 / 22.77 / 41.70

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8 γ Piscium

α 1h 7m 11s

δ + 6° 54' 53"

ϕ + 35° 27' 55"

log cos δ 9.99683

15 cos Stani 0.11919

I 207

Lang δ + 0.12 +1.01

sin z + .58

1876

	Dec. 6	Dec. 10	Dec. 13	Dec. 23	Dec. 24
	−.59	−46	−.53	−.39	−.42
hr mn s	h m s	h m s	h m s	h m s	h m s
1	6 20.0	6 15.6	6 21.9	6 26.8	6 17.5	6 10.3	6 0.4	5 41.3	5 58.7
	22.1	17.2	24.0	28.8	19.6	12.2	2.4	43.0	0.1
	23.6	18.8	26.0	30.3	21.7	14.7	4.6	45.2	2.4
	37	21.6	30.1	85.8	25.8	6.9	8.8	9.5	6.8
	37.0		32.4		27.8		10.7		9.0
7	12.0	7 6.5	34.5		29.9		12.8		11.1
	13.3	8.7	36.5		32.0		15.0		13.2
	14.6	10.7	38.6		34.0		17.0		15.3
	49	25.9	42.6		38.0		21.1		19.3
	49.6		44.8		40.2		23.2		21.4
	51.7		47.0		42.3		25.4		23.4
	43.09		37.84		32.88		14.14		18.16
	6 21.90	6 17.20	6 28.60			6 12.30		5 43.17	12.16
	7 13.30	7 8.63	6 34.00		6 29.891		6 12.855		6 11.055
	+39.96		+44.71		+49.25		+1 6.11		+1 7.94
	−.07		−.06		−.06		−.05		−.05
	−3.76		−3.73		−3.71		−3.62		−3.61
	+36.13		+40.92		+45.48		+1 2.44		+1 4.28
	7 15.30		15.32		15.37		15.30		15.33

1h 7m 15.324

+ 17.27	−.07	−.06	−.06	−.05	−.05		
1.23529							
1.35648							
	−34.13	+ 17.20	− 34.23	+ 1.26	+ 0.56	+ 27.89	
E F	1.53314n	1.23553	1.53441n	D.11059	~~0.07482~~	1.44545	
G H	1.65233n	1.35472	1.65360n	0.22978	9.74819	1.56464	
					9.86738		
′ °	30 0	30 1	30 0	30 1	30 0	25 4	
″ ″	8.1 11.2	15.3 18.1	4.3 7.6	12.6 14.7	30.9 34.7	27.9 33.2	5.75 5.61
	5.2 5.42	11.7 2.6	1.0 4.50	9.2 5.62	26.9 13.9	26.4 8.4	1.84 3.34
	13.3 12.54	2.40 2.07	5.3 11.26	21.8 13.09	5.78 5.79	14.3 4.16	9.99 8.95
	6.65 2.70	13.50 10.35	2.65 5.630	10.90 6.45	28.90 25.95	27.15 20.80	49.95 44.75
	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″
	30 4.67	31 11.92	29 59.47	31 8.17	30 27.42	30 23.97	29 47.35
	+ 22.72	− 44.91	+ 22.63	− 45.04	+ 1.70	+ 0.74	+ 36.70
	30 27.39	27.01	30 22.10	23.13	30 29.12	30 24.71	30 24.05
+6	52 20.96	21.34	52 26.25	25.22	52 19.23	52 23.64	52 24.30
35	26 12	27 19	26 06	27 15	26 34	26 31	25 54
	1.61235	1.61260	1.61230	1.61255	1.61240	1.61240	1.61225
	+1663	+1663	+4875	+4875	+960	+3164	+3954
	1.62898	1.62923	1.66105	1.66130	1.62200	1.64404	1.65179
	−42.86	−42.58	−45.82	−45.85	−41.88	−44.06	−44.85
	− .02	− .08	− .02	− .08	− .00	− .00	− .05
	− .03	− .36	− .82	− .34	− .13	− .13	− 1.54
	+ .04	+ .05	+ 00	+ .04	+ .01	+ .02	+ .19
	− 42.61	− 42.97	− 45.84	− 46.23	− 42.00	− 44.17	− 46.25
+6	51 38.35	38.37	51 40.41	38.99	51 37.23	51 39.47	51 38.05
	51 38.36	+3 56.84	51 39.70	+3 57.23	+3 57.51	+3 56.58	+3 56.27
		−1.2		−1.2	−1.2	−1.2	−1.2
		− 25.9		− 25.7	− 25.5	− 25.0	− 24.9
		+3 29.74		+3 30.33	+3 30.81	+3 30.38	+3 30.17
		+6 55 8.10		55 10.03	55 7.94 8.04	55 9.85	55 8.22

+6° 55′ 8.″85

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UC

Polaris δ+88° 39' 17" Jan.

f 12 59 δ +88 38 50 May

+88° 38' 34"

−46° 15' 46"

		Jan.	May
1		+526.98	+524.06
2		439.16	436.71
3		351.32	349.37
1		175.66	174.69
2	+	87.83	+87.39
3			
4	−	87.83	−87.34
5	−	175.66	174.69
1		351.32	349.37
2		439.16	436.71
3		526.98	524.06

1876

α_0	m s	13 21.338	21.185
Corr		+ .64	
$d\alpha/dt$		+21.9800	
δ_0	° ′ ″	38 53.22	52.84
Corr		− .13	
$d\delta/dt$		+19.055	

log cos δ 8.37065 Jan. 8.37306 May

tang δ + 35.51

~~sin z~~ − .72 sin z − .72

log I 1.94364 Jan. I 1.94123 May

I 87.83

I 87.34

I' 6.295

U.C −.04 Jan 10 .33 .2

U.C +.06 +.10 Jan 11

U.C +.05 Jan 13 .2

U.C −.31 May 3.9

U.C −.46 May 16

16	50.3			6	53.0	9	38.0	53	45.3	56	34.7	9	39.2	3	48.4	14	1.9			16	28.7		
						10	23.6			58	2.6	10	22.5	5	14.6								
						11	13.0	6	52.8	59	29.6	11	5.8	6	43.6								
						11	53.8			0	59.3	11	53.4	18	28.4								
						12	35.7	15	37.0	2	26.0	12	35.6	17	55.1								
21	42.7			14	23.8	13	21.3			22	53.7	13	17.4	21	22.7								
						14	3.1			24	21.8	13	59.1							13	19.06	14	46.4
						14	47.1			25	53.2	14	45.8								21.19	15	32.2
12	44.18	18	35.5			15	29.7			27	20.9	15	29.3								23.12	16	14.8
	4645	20	57.6							28	46.7												
	4582	21	32.8																				
							2647				3499		3081										
16	50.30			6	53.00		3247	6	52.80							14	1.90			16	28.70		
21	42.70	12	45.483	14	23.80	12	34967	15	37.00	12	34.990	12	34.233	12	40.633							13	20.185
										40			35.95										
		12	45.483			12	34967					12	36854									13	20.185
	+14.92	12	58.26		+14.99	12	57.31				+15.73	12	5529	+1	11.84					+1	20.44	12	22.38
	−+1.70		12.78		+ 2.55		22.34				+ 2.13		18.54		13.18		−8461				19.85	+	58.81
			12.58		+ 4.26		22.14						18.24				−8442					+	57.97
	+ 22.92				+23.88						+ 25.89			+1	6.31		+5.46			+	58.80		
	+ 36.14				+4568						+43.75			+2	502					+1	58.76		
13	21.62				20.65						20.60			12	5529								

	−244.82																						
	2.38888 w																						
	0.88445 s																						
			−53.722		+341.97		−108.83		+344.05		−180.15						−191.63		−188.52				
			2.73015 n		2.53395		2.03674 n		2.53662		2.25563 n						2.28246 n						
			1.22575 n		1.02959		0.53235 n		1.03222		0.75723 n						0.77745 n						
			45 1		45 1		45 1		45 0		45 1		45 1				45 2				45 2		
	43.7	52.2	50.2	58.7	26.5	33.1	40.9	47.2	47.0	51.8	28.2	33.0	45.1	49.7			13.5	15.3			18.7	20.5	
	48.6	38.0	54.2	43.8	31.5	25.4	46.0	39.7	54.2	49.3	88.0	30.0	50.0	46.1			17.1	23.7			34.5	31.1	
	12.3	90.2	44	102.5	58.0	58.5	69	69	101.2	101.1	61.2	30	95.1	158			106	390			53.2	54.6	
	46.15	45.10	52.20	51.25	29.00	29.25	43.45	43.45	50.60	50.55	306.0	315.0	475.5	479.0			15.30	19.50			26.60	27.30	
	46	45.62	46	51.72	46	29.12	46	43.45	45	50.57	46	31.05	46	47.12			47	17.40			47	26.95		
	− 7.66		− 16.82		+ 10.71		− 3.41		+ 10.77		− 5.67		− 5.64				5.99						
	46 37.96		34.90		46 39.83		40.04		1.34		+ 10.77						47 11.41						
											46 41.82		46 42.08										
+88	36 10.39		13.45		36 8.52		8.31				36 6.53		6.27				35 36.94						
−46	15 20		15 14		15 37		15 23				15 35		15 18				15 49						
	1.77880		1.77875		1.77890		1.77880				1.77890		1.77880				1.77890						
	+1573		+1573		+3010		+3010				+3987		+3987				+ 656						
	1.79453		1.79448		1.80900		1.80890				1.81877		1.81867				1.78546						
	+62.31		+62.30		+64.42		+64.40				+6589.		+ 6587				+61.02						
	− .77		− 3.71		− 1.50		− .15				− 1.52		− .42				− .47						
	− 13		− .13		− .10		− .12				− .12		− .14				− .53						
	+ .07		+ .07		+ .06		+ .07		+ .03		+ .06		+ .07				+ 09						
	+1 1.48		+0 58.53		+1 2.88		+1 4.20				+1 4.31		+1 5.38				+1 0.11						
+88	37 11.87		11.98		37 11.40		12.51				37 10.84		11.65				36 37.05						
	37 11.92	+2	2.37		37 11.96	+2	4.04				37 11.24	+2	3.91					+ 2	15.00			+ 2	21.25
	38 16.3	+	1.3		38 16.4	+	1.3				38 16.5	+	1.3				38 52.7	+	1.7				
	+ 2 4.4	−	23.6		+ 2 4.4	−	23.6				+ 2 5.3	−	23.6				2 15.1	+	0.1				
	4.5	+1	40.17		4.5	+1	41.74				5.4	+1	41.61				15.2	+2	16.60				
		+88	38 51.09			38	53.70					38	52.85					38	53.65				

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	Jan	May	July	Dec.
δ	+88 39 17	+88 38 50	+88 38 47	+88 39 35
2	−46 16 29	−46 16 2	−46 15 59	−46 16 47
tang δ	+42.58	+42.35	+42.32	+42.74
Sin z	−.72	−.72	−.72	−.72
Corr α	+.64	+.65	+.65	+.67
Corr δ	−.3	−.3	−.3	−.3
log cos δ	8.37065	8.37306	8.37333	8.36703
Bessel's i	8.49560	8.49499	8.49526	8.49139
	−.47.59	−.47.50	−.49	−.53.39
U.C.	−.08	−.08		−.05

log sin δ 9.99988
log c.48 887306
" const. 6.73672

	May 24.5	May 25	May 29	May 30	May 31	June 5.8
U.C.		−.08			−.08	
						Ch. J.
1	—	10 31.3	10 34.6	10 29.2	—	
	—	11 17.3	11 18.0	11 13.0	11 16.6	
	13 29.04 12 1.7	59.3	12 1.9	56.0	13 27.61 25.34	58.0
	—	12 43.7	46.4	12 44.4	25.97 12	42.3
	—	13 26.7	13 30.4	13 24.0	25.40 13	28.4
	30.16 14 57.5	14 7.6 16 47.2	14 15.3 16 42.3	14 5.0	27.03 14	10.7
	30.29 15 41.3	52.3	54.9	50.0	25.96	53.3
	—	15 37.1	15 36.6	15 33.1	24.09 15	35.1
		16 24.6	16 24.3	16 20.6	25.32 16	22.0
		2999	2624	2753		
	16 41.40	2399 12 10.30	7 55.07	2753		
	13 29.830	13 26.656 16 47.20	13 27.156 16 42.30	13 23.997	13 26.215	
	−36.52 12 28.43	−36.50 12 29.20	−36.64 12 31.95	−34.71 12 32.66	−34.95 12 33.41	
	−24.97 + 61.40	−21.18 + 57.46	−20.85 + 57.21	−16.52 + 51.26	−17.79 + 52.80	
	− 3.37 + 61.59	− 3.39 + 57.45	+ 57.40	− 3.39 + 51.45	− 3.39 + 52.99	
	+ 52.76	+ 51.98	+ 49.24	+ 48.52	+ 47.78	
	− 12.14	− 9.09	− 8.15	− 6.11	− 8.35	
	13 17.69	17.57	21.01	17.81	17.87	

			−194.74		+78.86		−198.04		+32.892		−198.38					
			2.289462		1.89686		2.296752		2.51709		2.297502					
			0.78445		0.39185		0.79174		1.01268		0.79249					
			45 2		45 2		45 2		45 2		45 2		45 1			
	A.R.		29.2 25.7		18.8 13.1		34.6 30.8		14.1 11.4		31.9 28.7		48.8 44.7		A.R.	
			42.2 45.2		31.3 34.2		46.8 50.5		30.0 33.1		47.3 51.0		4.2 7.3			
			71.4 70.9		50.1 47.3		81.4 81.3		44.1 44.5		79.2 79.1		113.0 112.0			
			35.70 35.45		25.05 23.65		40.70 40.65		22.05 22.25		39.60 39.85		56.50 56.80			
			47 35.57		47 24.35		47 40.67		47 22.15		47 38.72		46 56.25			
			− 6.09		+ 2.46		− 6.19		+ 10.28		− 6.20					
			47 29.48		47 26.81		34.48		47 32.43		32.52					
+0	88		35 18.87		35 21.54		13.87		35 15.92		15.83					
					Ex		Ex									
38	−46		14 45		15 10		14 53		15 12		14 55					
			1.77865		1.77875		1.77870		1.77875		1.77870					
			+188		−90		−90		+49		+49					
			1.78053		1.77785		1.77780		1.77924		1.77919					
			+60.33		+59.96		+59.95		+60.15		+60.14					
			− .49		− .08		− .50		− 139		− .51					
			− .60		− .55		− .62		− .55		− .60					
			+ .10		+ .10		+ .11		+ .10		+ .10					
			+ 5934		+ 5943		+ 5894		+ 5831		+ 5913					
+			36 18.21		36 20.98		36 1281		36 14.23		14.96					
		+ 2 27.60		+ 2 28.65					36 14.60	+ 2 32.27			+ 2 32.77			
		1.4	38 48.1	+ 1.4	38 47.6		38 47.6		38 47.5	+ 1.4						
			+2 29.9	+ 4.7			+2 34.8		+2 329	+ 5.3						
			30.0	+2 34.75			34.9		33.0	+2 38.97						
							2 34.60									
				38 52.96			+ 1.4			38 53.57						
							+ 5.2									
							+2 41.20									
							38 54.01									

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	Jan	May–July	Dec.
Φ′	13 20.98	20.99	21.01
N.A.	21.18		
Φ′ − N.A.	−0.20	−.19	−.17

Φ′	38 52.9
N.A.	52.8
Φ′ − N.A.	+ .1

−.61 July 10

Read in B_3. −.88 −.07

Read in B_5 Sept. 3 6

U.C. −.57 Dec 5 8

U.C. −.57 Dec 6

U.C. −.46 Dec 10. 3

| | | |

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See last page of this book for the remainder of this cellar

	M.C −.53 Dec 13	M.C −.55 Dec 14	M.C −.41 Dec 19	M.C −.39 Dec 23	M.C −.42 Dec 24	M.C −.36 Dec 27.5
	13 18.59	13 18.05	13 8.48	12 48.38	12 45.03	12 39.09
	13 45.37	13 44.72	13 40.74 +1 6.12	13 37.17 +1 7.95	13 36.37 +1 13.63	13 34.14
+49.25	− 26.98	− 26.67	− 40.26	− 48.79	− 51.34	− 55.05
−72.65	− 26.61	− 26.50	− 40.09	− 48.62	− 51.17	− 54.88
	+50.42	+57.78	−16.67	−17.95	−15.39	
	−23.54	−17.52				
−2418	−23.54	−19.55	−1.599	−15.18	−1.296	
+2.42	+3.37	+20.71	+ 33.46	+ 34.82	+ 45.28	
21.01	21.42	21.19	21.84	19.85	24.37	
	48 14.92	48 15.29	48 16.61	48 15.39	48 17.65	—
+88	34 33.43	34 33.06	34 31.74	34 32.96	34 30.70	
−46	15 38					
	1.77890	1.77890	1.77890	1.77890	1.77890	1.77890
	+965	+1220	+3462	+3192	+3962	+2746
	1.78855	1.79110	1.81352	1.81082	1.81852	1.80636
	+6145	+6182	+6509	+6469	+6584	+6403
	− .99	− .99	− 1.02	− 1.06	− 1.06	−
	+ .13	+ .13	+ .13	+ .13	+ .13	
	+1 059	+1 0.96	+1 4.20	+1 3.76	+1 4.91	+1
	35 34.02	35 34.02	35 35.94	35 36.72	35 35.61	
	+3 57.51	+3 57.50	+3 56.85	+3 56.58	+3 56.27	+3 56.81
	39 33.6 + 1.4	39 33.8 + 1.4	39 34.9 + 1.4	39 35.5 + 1.4	39 35.6 + 1.4	39 36.0 + 1.4
	+3 59.6 − 40.8	+3 59.8 − 40.9	+3 59.0 − 42.1	+3 58.8 − 42.7	+4 0.0 − 42.7	− 43.2
	59.7 +3 18.11	59.9 +3 18.00	59.1 +3 16.15	58.9 +3 15.28	0.1 +3 14.97	+3 15.01
	38 52.13	38 52.02	38 52.09	38 52.00	38 50.58	

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δ Cassiop. α_0 1h 17m 39s +59° 35′ 5″ $\frac{d\alpha}{dt}$ Corr $\frac{d\delta}{dt}$ −17 12 17 δ_0 Corr

1876

+ Jan 11 +.06 +.10

Dec. 13 + −.53

Dec. 14 × −.55

Dec 23 × −.39

Dec. 24 × −.42

Dec. 27 × −.36

Log cos δ 9.70439 | 15 cos Stan i 9.82934 | 9.82675 | Jan 1876 Dec.

Log I 1.60990 | I 417

Long + 1.70 +1.98 | Sin Σ − .30

| | | |

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Yr. 2001

L_0 13 22 57

λ_0 −73° 2′ 27″

β_0 106° 57′ 33″

Δ_0 −64° 34′ 45″

Long λ + .32

$\frac{d\lambda}{dt}$ + 1.5176

$\frac{d\beta}{dt}$ + .4

$\frac{d\Delta}{dt}$ − 18.778

log cos 9.46511n

15 cos Stan 9.59006n Jan
9.58747n Dec.

log Σ −3.27 −3.42

sin z −.90

log Σ 0.84918

Σ 707

$\frac{1}{\Sigma}$ .353

1876 + Jan 11

	Dec. 23	Dec. 24 +	Dec. 27 +
	+.06 +.04	−.39	−.42	−.36
	+.10 +.10			

22	22 58.61	22	59.91	Jan 11	22	59.91	+42	1	44.7	3		
				Dec 16	22	59.49	39	1	28.3	12		
				21		59.88	39		27.1	10		
				26		60.27	41		26.1	9		
				31		60.68	41		25.2	8		
				36		61.09			24.4			

	2 8.58		2 3.18	21	3.7	21	38.8	21	18.3	21	87.0	21	18.7	21	81.7		
	57 51.42		3.48		8.5		42.3		23.5		40.6		28.3		85.1		
			38.6		13.9		45.8		28.0		44.0		32.2		88.7		
			42.0		26.1		49.3		69.8		47.7		79.2		92.3		
			45.7				52.7				51.2				45.7		
−24	29.4		48.2				56.1				54.8				49.4		
			52.9				59.8				57.7				52.7		
			56.3				3.6				1.9				36.5		
			59				7.1				5.3				05		

			35 18				35 55				34 02				35 21		
22	28 80		41 18	21	8.70		47 55	21	23.27		46 02	21	26 40		41 21		
24	29 40	22	45.756			21	52.833			21	51.133			21	45.789		

	+114.99	22	59.931	+1	6.13	22	60.016	+1	7.96	22	60.094	+1	13.64	22	60.332		
	−.20		14.18		+1.28		67.18		+1.37		68.96		+1.18		74.54		
	−.34		14.45				67.50				69.28				74.86		
	−1.73				−1.85				−1.93				−2.17				
	12.72			+1	5.56			+1	7.40			+1	12.65				
+22	58.48				+58.39				+58.63				+58.44				

	+ 16.96		−.20				+1.28				+1.37				+1.18		
	1.229.43		−.34														
	0.81949n																
			−03.64		+44.13				+27.86				+19.39				
E	F		2.01553n		1.64473				1.44498				1.28758				
G	H		1.60559		1.28220n				1.03245n				98.7505n				
	25 3		25 3		30 0				30 0				30 0				
	53.0	59.8	8.1	14.0	44.4	53.4			38.8	48.1			33.1	41.9			
	57.7	51.2	10.2	5.6	46.4	21.8			41.4	15.6			33.6	11.2			
	107	110	183	196	108	752			802	637			7	531			
	55.35	55.50	9.15	9.81	45.40	37.60			40.10	31.85			33.35	26.55			
	28	55.42	28	9.47	30	41.50			30	35.97			30	29.95			
	− 6.60		+ 40.33		− 17.07				− 10.78				− 7.50				
	28 48.82		49.80		30 24.43				30 25.19				30 22.45				
4106																	
	53 59.53		58.55		52 23.92				52 23.16				52 25.90				

−64	33 11		33 57		33 11				33 17				33 23				
	2.08065		2.08087		2.08065				2.08068				2.08071				
	+3035		+3035		+3240				+3976				+2780				
	2.11100		2.11122		2.11305				2.12044				2.10851				
	+129.42		+129.19		+129.33				+131.96				+128.38				
	+12.91		+2.92		+12.97				+13.20				+12.84				
	+ .04		+ 1.64		+ .30				+ .11				+ .06				
	− .27		− .22		− .22				− .19				− .16				
	+ .12		+ .13		+ .03				+ .02				+ .02				
	+2 09.01		+ 2 10.74		+ 2 09.81				+ 2 11.90				+ 2 18.30				
7	56 8.54		9.29		54 33.76				54 35.06				54 34.20				
106	56 8.92	+ 2.	9.88		33.3	+ 3	56.58		33.5	+ 3	56.27		34.0	+ 3.	56.81		
	584 44.7	153	+1.7	584	26.7		+1.7	584	26.0		+1.7	584	25.9		+1.7		
	+2 6.4		−3 59.6	+3	59.5		−3 35.3	+3	58.4		−3 35.4	+3	59.8		−3 34.6		
	6.0		− 23.9		59.1		−41.9		58.0		−42.1		59.4		− 42.6		
		+1	41.84			+ 3	16.38			+ 3	15.87			+ 3.	15.91		
106		+57	50.76			+57	50.14			+57	50.93			+57	50.11		

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η Piscium

α_0 24m 50.936s

p	24m	48s	Corr			Dec 6		24	54	8	3	42	49.2	1	log cos δ	9.98555			
				+ .06		11			54	78	3		49.1	1					
+14°	42′	2″	dα/dt	+ 3.1989		16			54	75	4		49.0	1	15 cos δ tani	0.10791			
						21			54	71	4		48.9	2					
+27	40	46	δ_0	42 21.19		26			54	67			48.7	2	Lang δ	+0.26	+1.03		
			Corr°	− .3											sin z	+.46			
			dδ/dt	+ 18.704															

1876

	−.39	−.42	−.36
	Dec. 23 ×	Dec. 24 +	Dec. 27 ×

1	23	24.3	23	36.0	23	19.9	23	34.0	23	18.0	23	28.3							
		26.4		38.0		21.7		36.2		19.8		30.5							
		25.3		40.3		22.5		38.4		21.8		32.7							
		19.0		44.4		63.1		42.7		58.6		36.9							
				46.6				44.8				39.0							
	23	36.2		48.7	24	3.8		47.0	24	7.5		41.2							
		37.8		30.7		6.3		49.0		8.9		43.3							
		39.7		53.0		8.0		51.3		10.5		45.5							
		23.7		37.4		18.1		33.5		26.9		49.6							
				55.5				37.7				37.8							
				1.6				59.7				34.0							
				47.62				57.64				45.28							
	23	26.33		53.62	23	31.70			23	19.87									
	23	57.90	23	48.745	24	6.03	23	46.945	24	8.97	23	41.164							
	+1	6.13	24	51.692	+1	7.97	24	54.684	+1	13.65	24	54.660							
		−.10		− 65.95		−.11		− 67.74		−.09		− 73.50							
				− 66.0				− 67.80				− 73.56							
		−3.750				−3.75				−3.72									
	+1	2.24			+1	4.11			+1	9.84									
	+24	51.01				+51.05				+51.00									
		+22.482		−.10				−.11				−.09							
		1.35064																	
		1.458555																	
				− 9.165		+25.285		−19.088		+21.29		−27.81							
	ℰ	ℱ		0.96142n		1.40226		1.28058n		1.32818		1.44420n							
	ℊ	86		1.06933n		1.51017		1.38849n		1.43609		1.55211n							
		40′	2″	40	3	40	2	40	3	40	2	40	4						
		12.1	1.4	38.9	42.0	54.9	56.9	57.1	53.0	52.6	22	1.9	3.9						
		54.4	378	34.5	17.4	50.1	32.1	44.6	31.4	55.9	37.9	56.8	45.3						
		135	992	134	594	50	890	987	844	155	1001	1187	1092						
		56.75	49.60	36.70	29.70	52.50	44.50	47.85	42.20	57.75	50.05	59.35	54.60						
		42′	53.18″	43′	33.20″	42	48.50	43	45.02	42	53.90	43	56.98						
		+	28.74	−	11.73	+	32.37	−	24.46	+	27.30	−	35.66						
		43	21.92		21.47	43	20.87		20.56	43	21.20		21.32						
+14		39	26.43		26.88	39	27.48		27.79	39	27.15		27.03						
27		39	00	39	46	38	56	39	52	39	01	38	04						
		1.47940		1.47960		1.47940		1.47965		1.47940		1.47970							
		+3240		+3240		+3976		+3976		+2780		+2780							
		1.51180		1.51200		1.51916		1.51941		1.50720		1.50750							
		−*32.48		−*32.51		−*33.05		−*33.07		−*32.16		−*32.17							
		− .07		− .01		− .08		− .09		− .06		− .10							
		− .93		− 1.12		− .90		− 1.22		− .93		− 1.25							
		+ .12		+ .14		+ .11		+ .15		+ .12		+ .16							
		−33.37		−33.50		−33.92		−34.16		−33.02		−33.36							
+14	38	53.06		53.38	38	53.56		53.63	38	54.13		53.67							
	38	53.22	+3	56.58	38	53.59	+3	56.27	38	53.90	+3	56.81							
	42′	48.8		−.09	42	48.8		−.09	42	48.6		−.09							
	+3	55.6		−*27.6	+3	55.2		−*27.6	+3	54.7		−*27.4							
		58.3	+3	28.08		54.9	+3	27.77		54.4	+3	28.51							
14			+42	21.30			+42	21.36			+42	22.41							

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30 Cassiop.

1ʰ 28ᵐ 34ˢ

+72° 24′ 5″

− 30° 01′ 17″

1876 + Jan 11

	m	s
α	28	38.509
cons	+	.07
$\frac{d\alpha}{dt}$	+	4.6545
	′	″
δ_0	24	24.05
cons	+	.7
$\frac{d\delta}{dt}$	+	18.546

log cos δ 9.48054

15 const tan 9.61549. Jan. 9.60290 Dec.

tang δ + 3.15 + 3.31

sin z − .50

	Jan 11	Dec 6	11	16	21	26
m	28	28	28	28	28	28
s	37.18	44.20	44.00	43.78	43.54	43.29

	Jan 11	20	22	24	25
′	24	25	25	25	25
″	46.3	22.2	33.3	42	50
		11	9	8	7
				5.0	5.7
				7	6

	Jan 11	Dec. 14	Dec. 24	Dec. 27
		−.55	−.42	−.36
	+.06			
	+.10			

Jan 11			Dec. 14			Dec. 24			Dec. 27		
m	s		m	s		m	s		m	s	
27	39.5		27	21.6		27	10.6		27	23.0	
	42.8			25.6			16.3			26.7	
	43.3			33.4			22.2			29.7	
	13.6			80.6			49.1			33.6	
29	4.7								27	33.2	
	10.4									58.2	
	15.0									4.2	
	30.1									15.4	

Jan 11			Dec. 14			Dec. 24			Dec. 27		
		1970			3174			3316			2782
27	43.87		27	26.887		27	16.37		26	10.808	
29	10.03		28	21.889		27	55.267		27	36.842	

+15.00	28	37.172	+50.43	28	43.857	+1	7.97	28	43.378	+1	13.65	28	43.225		
+.19	−	1.528	−1.73	−	48.59		−1.32	−	66.53		−1.13	−	72.31		
+.33	−	1.535		−	48.66			−	66.60			−	72.38		
+1.34			−5.35				−4.87				−4.72				
+16.86			+43.85			+1	1.78			+1	7.80				
+28 38.75			+38.62				+38.62				+38.71				

+38.02		+.19			−1.73			−1.32				−1.13			
1.58001		+.33													
1.18550															
												−2.62			
		−48.14	+28.40				+20.47				+80.11	−20.22			
ℰ	ℱ	1.68251n	1.45332				1.31117				1.90369	1.30578n	1.44122n		
𝒢	ℋ	1.28800n	1.05622				0.91402				1.50659-	0.90868n			
′	′														
0	0	0 1	0 2				0 1	0 2			0 1	0 2			
″	″														
25.0	29.8	0.3 3.4	8.9 15.9				59.2 4.6	11.9 19.4			46.4 33.2	30.1 37.7			
27.6	21.1	0.0 56.9	6.2 43.4				56.4 31.8	9.1 47.3			44.8 23.3	28.1 17.7			
12.6	10.9	0.3 11.8	1.51 11.93				1.56 9.64	2.10 12.67			9.12 7.65	5.82 4.84			
26.30	25.45	0.15 5.99	7.55 59.65				57.80 48.20	10.50 83.35			45.60 38.25	29.10 22.70			
′	″	′													
0	25.87	x′ 5.77	2 33.60				1 53.00	2 36.92			1 41.92	2 25.90			
+	15.33	− 19.41	+ 11.38				+ 8.20	+ 8.20			+ 32.11	− 3.70			
0	41.20	5.61	2 14.98					2 15.12			2 14.03	14.83			
+72	22 7.15	2.24	20 33.37					20 33.23			20 34.32	33.52			
−3															
−30	1 40	1 6	1 49					1 46			2 11	1 27			
	1.52210	1.52195	1.52215					1.52215			1.52225	1.52205			
	+3040	+3040	+1226					+3979			+2788	+2788			
	1.55250	1.55235	1.53441					1.56194			1.55013	1.54993			
	+35.69	+35.67	+34.23					+36.47			+35.49	+35.48			
	− .23	− .36	− .13					− .06			− 1.00	− .12			
	− .03	− .07	− .86					− .67			− .54	− .77			
	+ .02	+ .04	+ .08					+ .08			+ .03	+ .10			
	+35.45	+35.28	+33.56					+35.82			+33.98	+34.69			
+72	22 42.60	43.02	21 6.93					21 9.05			21 8.30	8.21			
	22 42.81	+2 4.04			+3 57.50						21 8.26	+3 56.81			
	24 46.8	+.08	25 3.9		+.09			25 8.5			25 8.39	+.09			
	+2 3.5	−+2.23	+3 57.0		−+39.4			+3 56.4			+3 57.6	−+41.6			
	4.2	+1 42.54	57.7		+3 18.50			57.1			58.8	+3 15.81			
								+3 56.27							
								+.09							
								−+41.5							
72		+24 25.35			+24 25.43			+3 15.67				+24 24.07			
								+24 25.43							

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51 Andr = ι Persei

1h 30m 20s Cons +47° 59' 38" dα/dt dδ/dt

−5° 36' 30 δ0

1876

−.55 −.42 −.36

Dec. 14 + Dec 24 + Dec. 27 +

Dec 6 11 16 21 26

log cos δ 9.82551
15 cos δ tan i 9.94787
log a 1.11 +1.49
sin z −.10

I 3.08

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Gr. 2029

13 34 11

+71° 52' 43"

+108° 07' 17"

-65° 44' 29"

α_0 34 12.38 — Dec 6.8

Corr + .12 — 11

.2 — 16

$\frac{d\alpha}{dt}$ + 1.4315 — 21

" — 26

δ_0 52 25.2 — 34 12.64

Corr − .1 — 13.00

$\frac{d\delta}{dt}$ − 18.373 — 13.22

13.68

14.04

31 33 35 36

51 — 48.3 46.8 45.4 44.1 43.0 — 16 15 14 13 11 10

log cos δ 9.49308n

15 cos δ tan i 9.61544n

Long δ ∓3.05 − 3.22

sin z − .91

1876

−.57 −.42 −.36

Dec. 5 + Dec. 24 + Dec. 27 +

13	32	42.7	33	19.3	32	35.9	32	51.5	32	37.1	32	46.0
		50.4		22.7		42.0		14.9		43.1		49.6
		53.5		25.8		48.9		58.1		50.2		52.6
		14.61		29.2		12.68		1.8		13.04		36.0
				32.6				4.9				59.0
	33	54.1		35.9				8.2				3.0
		58.6		39.1				11.4				6.7
		5.3		42.0				14.6				9.6
		17.80		45.8				18.2				12.8

				29.24				22.36				28.53
	32	48.70			32	42.27	40	4.36	32	48.47		53.53
	33	59.33	33	32.489			33	4.484			32	5.637
												89.48
		+38.50	34	12.675	+1	7.98	34	13.878	+1	13.65	34	14.094
		+1.74		− 40.13		+1.28		− 69.39		+1.10		− 75.461
				− 40.25				− 69.51				− 75.573
		− 0.31				−1.57				−1.789		
		39.93			+1	+7.69			+1	12.96		
	+34	12.42			+34	12.17				+ 12.44		
		+43.79		+1.74				+1.28				+1.10
		46437										
		1.25681n										
				−2.684		+22.21				+14.01		
										+14.90		
				1.42878n		1.34655				1.20439		
				1.04422		0.96199n				0.81983n		
			20	1	20	0	20	1			20	0
		10.8	1.86	41.2	49.2	1.6	11.2			54.2	5.3	
		18.6	5.18	41.3	22.2	2.8	38.0			57.7	34.8	
		24.4	13.14	8.25	7.14	4.4	4.92			1.19	10.01	
		12.20	5.70	41.25	35.70	2.20	24.60			55.95	50.05	
							5846					
		21	8.95	20	38.48	24	19.30			20	53.00	
		− 18.06		+ 11.07		− 9.16				− 6.60		
	20	50.89		49.55	20	49.24				20	46.40	
+108	2	57.46		58.80	1	59.11				2	1.95	
−65												
	42	44	43	15	42	55				43	00	
	2.10	3442	2.10359		2.10349					2.10352		
		+2164		+2144		+3987				+2805		
	2.12	506	2.12523		2.14336					2.13157		
		+133.34		+133.42		+139.11				+135.38		
		+132.87		+ .12		+ .08				+ .04		
		+ .31										
		− .33		− .18		− 30				− .29		
		+ .04		+ .02		+ .04				+ .04		
+108	+2	13.39	+2	13.38	+2	18.93				+2	15.17	
−65	4	10.85		12.18	4	18.03				4	17.12	
	4	11.51	+3	56.87	8	16.54	+3	56.27	8	1.72	+3	56.81
	8	52		11.3	+1.8	54		46.3		+1.7	51	42.8
	+3	59.8		−+36.3	34	58.5		−+41.5	+4	0.1		−+42.2
		59.9	+3	22.37		58.6	+3	16.47		0.2	+3	16.31
	108		+7	33.88			+7	34.51			+7	33.43
								33.01				

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V. Piscium

α_0 — m s
34 58.772

1h − m 34 56 Cons — s .01

+ 4° 51′ 15″ $\frac{d\alpha}{dt}$ + 3.1169

+ 37° 31′ 33″ δ_0 ′ ″ 51 33.55

Cons + .2

$\frac{d\delta}{dt}$ + 18.355

1876

Dec. 14				Dec. 24				Dec. 27			
−.55				−.42				−.36			
1	33	57.6	33	58.9	33	44.0	33	42.4	33	34.1	33	36.5
		53.7		2.0		45.9		44.4		36.0		38.6
		53.3		4.0		48.0		46.5		38.2		40.6
				8.3				30.6				44.7
				10.2				52.6				47.0
	34	40.9		12.3				34.7				48.9
		42.3		14.5				36.8				37.1
		43.5		16.4				58.9				53.1
				20.6				8.0				57.3
				22.7				8.0				59.3
				24.8				7.0				1.3
				1957				4219				4784
	33	53.60	33	13.57	33	45.99	33	60.19	33	36.10		53.84
	34	42.23	33	12.336			33	54.718			33	48.945
		+50.43	35	2.640	+1	7.98	35	2.564	+1	13.66	35	2.538
		−.05		− 50.30		−.04		− 67.85		−.04		− 73.59
				− 50.29				− 67.84				− 73.58
		−3.87				−3.79				−3.77		
		46.51			+1	4.15			+1	9.85		
	+34	58.85				+58.87				+58.79		
		+18.74		−.05				−.04				−.02
		1.27277										
		1.39356										
				− 29.89		+ 8.75				+ 12.84	5	
		ε		1.475538n		0.942.01				1.10890		
		8		76 1.59632n		1.06280				1.22969		
				30 3		30 4		30 3				
				38.2	43.0	41.3	46.2	48.1	52.3			42.5	47.4
				35.7	21.6	37.2	28.7	44.9	31.1			38.9	26.2
				739	646	785	749	930	834			814	736
				3695	3230	3925	3745	4650	4170			4070	3680
				33	34.62	34	38.35	33	44.10			33	38.75
				+ 24.75		− 39.47		+ 11.56				+ 16.97	
				33	59.37		58.88	33	55.66			33	55.72
	+ 4			48	48.98		49.47	48	52.69			48	52.63
	+37			29	42	30	45	29	51			29	46
				1.644490		1.644520		1.644495				1.644495	
				+ 1228		+ 1228		+ 3987				+ 2805	
				1.645718		1.645748		1.648482				1.647300	
				− 45.41		− 45.44		− 48.40				− 47.10	
				− .02		− .04		− .01				− .01	
				− 1.12		− 1.43		− 1.18				− 1.15	
				+ .14		+ .18		+ .15				+ .14	
				− 46.41		− 46.73		− 49.44				− 48.12	
	+ 4	+ 48		2.57		2.74	48	3.25			48	4.51	
	+ 4	48		2.65	+ 3	57.50			+ 3	56.27			+ 3	56.81
		51		58.3		− 1.3	51	57.6		− 1.3	51	57.4		− 1.2
		+ 3		55.6		− + 24.7	+ 3	54.4		− + 24.0	+ 3	52.9		− + 23.8
				55.8	+ 3	31.50		54.6	+ 3	30.97		53.1	+ 3	31.81
	4				+ 51	34.15			+ 51	34.22			+ 51	36.32

Dec.	m	s		"
6	25	26.9	3	58.8 3
11		26.6	3	58.5 3
16		26.3	4	58.2 3
21		25.9	4	57.9 3
26		25.5		57.5 4

51

log cos δ 9.99843

15 cos δ tan i 0.12079

Long δ + 0.09 + 1.00

sin z + .61

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E Cassiopeiae

α_0 — 1h 45m 25s

Corr — −.01

$\frac{d\alpha}{dt}$ — +4.2452

δ_0 — +63° 3′ 11″

Corr — +.3

$\frac{d\delta}{dt}$ — +17.950

1876

	Dec. 3	Dec. 14	Dec. 24	Dec. 27
	−.57	−.55	−.42	−.36
	+	+	+	+
1	44 48.7	44 48.0	43 49.3	44 36.1
	54.2	50.5	52.6	38.4
	57.0	52.9	56.0	40.8
		53.2		43.0
		57.4		45.3
45	28.4	59.8		47.6
	33.0	2.0		49.7
	36.8	4.2		52.0
		6.4		54.4
		33.64		40.73
44	54.30	51.64	43 52.63	6
45	32.80	44 57.378		44 45.255
	+38.51	45 34814	+50.44	45 34628
	−.12	− 3744	−.08	− 49.37
		− 37.43		− 49.36
	−5.24		−5.05	
	+32.18		+44.31	
45	29.53		+29.57	
	+3.08	−1.12		−1.08
	0.48855			
	0.26709			
		−35.42	+52.63	
		1.54925n	1.72123	
		1.32779	1.49977	
	20 3	20 3	20 2	
	5.4 9.9	27.5 31.9	33.1 39.3	
	4.9 44.6	27.1 6.2	32.2 10.4	
	103 1145	546 381	653 497	
	5.15 5725	27.30 19.05	32.65 24.85	
	23 1.20	23 23.18	22 28.75	
	+ ~~18.50~~ 1.85	− 21.27	+ 31.61	
	23 3.05	23 1.91	23 0.36	
+63	59 45.30	46.44	59 47.99	
−20	40 52	40 30	41 24	
	1.33715	1.33700	1.33735	
	+ ~~20.98~~ 21.98	+ ~~20.98~~ 21.98	+ 1.205	
	1.35913	1.35898	1.34570	
	+22.86	+22.186	+22.37	
	− .00	− .28	− .61	
	− .90	− 1.02	− .78	
	+ .12	+ .14	+ .10	
	+22.08	+21.69	+21.08	
+63	0 7.38	8.13	0 9.07	
+63	0 7.76	+3 56.87	+3 57.50	
	4′ 5.16	+0.7	4 7.3	
	+3 57.8	−+36.2	+3 58.2	
	58.1	+3 21.37	58.5	
63		+3 29.13	+3 29.37	

	Dec. 6	Dec. 11	Dec. 16	Dec. 21	Dec. 26
m	45	45	45	45	45
s	34.80	34.70	34.59	34.46	34.32
′	10	11	13	14	
	4				
″	5.8	6.8	7.6	8.3	8.9
	11	10	8	7	6	5

	Dec. 6	Dec. 11	Dec. 16	Dec. 21	Dec. 26
	−.42				
	+				
43	33.8	43 38.2	43 42.4		
44	18.0	20.1	22.5	24.7	
	27.3				
44	39.4	41.8	44.7		
	29.4	31.7	34.0	36.2	
	24.39				
43	38.80				
44	27.100				
	+1 7.99	−.83			
45	34369	− 67.27			
	− 67.26				
	−4.79				
	+1 2.37				
	+29.47				
	−.83				
		+48.30	−15.63	+42.37	
		1.68395	1.19396n	1.62706	
		1.46249	0.97250n	1.46560	
		20 2	20 3	20 2	
		33.9 41.0	13.6 18.8	37.8 43.1	
		34.8 10.2	12.3 52.0	36.7 14.8	
		708 512	259 1718	745 579	
		35.40 25.60	12.95 ~~80.90~~ 85.90	37.25 28.95	
		22 30.50	23 36.92	22 33.10	
		+ 29.01	− 9.39	+ 25.544	
		22 59.51	57.53	22 58.554	
		59 48.84	50.82	59 49.81	
		41 22	40 46	41 20	
		1.33735	1.33735	1.33730	
		+ 4003	+ 4003	+ 2841	
		1.37738	1.37715	1.36571	
		+23.84	+23.83	+23.21	
		− .52	− .56	− .40	
		− .80	− .99	− .80	
		+ .10	+ .12	+ .10	
		+22.62	+22.90	+22.11	
		0 11.46	13.72	0 11.92	
		0 12.59	+3 56.27	+3 56.81	
		4 8.7	+0.7	4 9.0	
		+3 56.1	−+39.3	+3 57.1	
		56.64	+3 17.67	57.4	
		+3 29.37	+3 ~~29.13~~ 30.26	+3 29.73	

	Dec. 3	Dec. 14	Dec. 24	Dec. 27
	+	+	+	+
1	44 48.7	44 48.0	43 49.3	44 36.1
	54.2	50.5	52.6	38.4
	57.0	52.9	56.0	40.8
		53.2		43.0
		57.4		45.3
45	28.4	59.8		47.6
	33.0	2.0		49.7
	36.8	4.2		52.0
		6.4		54.4
		33.64		40.73
44	54.30	51.64	43 52.63	6
45	32.80	44 57.378		44 45.255
	+38.51	45 34814	+50.44	45 34628
	−.12	− 3744	−.08	− 49.37
		− 37.43		− 49.36
	−5.24		−5.05	
	+32.18		+44.31	
45	29.53		+29.57	
	+3.08	−1.12		−1.08
	0.48855			
	0.26709			
		−35.42	+52.63	
		1.54925n	1.72123	
		1.32779	1.49977	
	20 3	20 3	20 2	
	5.4 9.9	27.5 31.9	33.1 39.3	
	4.9 44.6	27.1 6.2	32.2 10.4	
	103 1145	546 381	653 497	
	5.15 5725	27.30 19.05	32.65 24.85	
	23 1.20	23 23.18	22 28.75	
	+ ~~18.50~~ 1.85	− 21.27	+ 31.61	
	23 3.05	23 1.91	23 0.36	
+63	59 45.30	46.44	59 47.99	
−20	40 52	40 30	41 24	
	1.33715	1.33700	1.33735	
	+ ~~20.98~~ 21.98	+ ~~20.98~~ 21.98	+ 1.205	
	1.35913	1.35898	1.34570	
	+22.86	+22.186	+22.37	
	− .00	− .28	− .61	
	− .90	− 1.02	− .78	
	+ .12	+ .14	+ .10	
	+22.08	+21.69	+21.08	
+63	0 7.38	8.13	0 9.07	
+63	0 7.76	+3 56.87	+3 57.50	
	4′ 5.16	+0.7	4 7.3	
	+3 57.8	−+36.2	+3 58.2	
	58.1	+3 21.37	58.5	
63		+3 29.13	+3 29.37	

log cos δ 9.65638

15 cos sin 9.77866

tang δ +1.97 +2.20

sin z −.35

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β Arietis

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50 Cassiop.

α_0 1h 52m 48s

Corr^n + .16

$\frac{d\alpha}{dt}$ +4.9838

δ_0 +71° 48' 54"

Corr^n − .2

$\frac{d\delta}{dt}$ +19.694

1876

− 29° 26' 06"

log cosδ 9.49424

log constant 9.61660

tangδ +3.04 +3.20

sin z −.49

	− .57	− .55	− .41	− .36
	Dec. 5 +	Dec. 14 +	Dec. 19 +	Dec. 27 +
1	50 8.80 (53.9)	52 9.4 13.0 16.3 19.6 22.8	51 13.1 16.6 23.0	51 57.3 0.6 3.8 6.9 10.3
	51 39.5 44.5 50.7	52 26.0 29.5 32.6 36.1	52 36.8 41.7 48.5	52 13.8 17.0 20.4 24.0
		2053		1541
	50 58.57		51 17.57	9.46
	51 44.90	52 22.811	52 42.33	52 04.55
	+38.52	52 59272	+50.45	52 58973
	−1.73	− 38.96	−1.67	− 48.52
		− 36.62		− 48.68
	−6.45		−6.15	
	+30.84		+42.63	
	+52 53.15		+53.09	
	+84.24	−1.73		−1.67
	1.92552			
	1.54212			
	☉ ☽	+37.91	+52.59	−31.87
		1.57845	1.72334	1.503.38 n
	☽ ☿	1.19535	1.33997	1.11998
		35 2	35 2	35 2
	0.1 6.1	20.5 25.9	11.3 19.0	47.1 53.2
	58.1 37.0	18.4 57.5	10.6 46.0	44.5 25.9
	1192 1031	389 1434	219 1250	916 811
	59.60 51.55	19.45 71.70	1095 62.50	45.80 40.56
	36 55.58	37 45.58	37 36.72	37 43.18
	+ 34.84	+ 1568	+ 21.88	− 1318
	37 30.42	31.26	37 28.60	30.00
+ 71	45 17.93	17.09	45 19.75	18.35
−29	26 57	26 37	26 46	26 10
	1.51187	1.51189	1.51185	1.51165
	+2269	+2269	+1289	+3492
	1.53408	1.53401	1.52424	1.52404
	+34.20	+34.20	+33.44	+33.42
	− 1.17	− .23	− .46	− .16
	− .57	− .66	− .65	− .84
	+ .08	+ .09	+ .08	+ .11
	+ 32.54	+ 33.40	+ 32.41	+ 32.53
+ 71	44 45.30	43.60	44 47.34	45.82
+ 71	45 50.48	50.49	45 51.02	53.85
	45 50.48		45 51.02	53.66
	49 48.1	+3 56.87	49 50.1	+3 57.50
	+0 57.6	+1.0	+3 58.6	+1.0
	57.4	−3.86	58.4	−3.86
		+3 21.27		+3 19.90
71		+49 11.73		+49 11.42

	50 Cassiop.															

1876phae.proj.1481.

γ Andromedae

α 56 14 s

δ + 41° 43' 43"

+ 0° 39' 05"

1876 + −.04

Jan 10

	m	s	m	s		m	s		m	s		m	s		m	s
	55	30.8	55	46.1		55	45.6		55	—		55	3.7		55	15.3
		34.1		48.8			48.0			—			6.2			18.3
		36.0		51.6			50.7			—			9.1			21.0
				57.0												26.6
				59.7												29.4
	56	54.8		2.6								55	56.3			32.0
		57.2		5.5									58.7			34.9
		0.2		8.2									1.2			37.7
				13.7												43.2
				16.4												45.9
				19.3												48.7
				32.89												3532
	55	33.63		28.9	55	48.10			55	6.33				55	30.40	
	56	57.40	56	2.627			55	44.62	55	58.73	55	32.109		56	10.13	

Jan 1 6 11 16 21

	m	s		
56	17.45	8	44	16.6 0
	17.57			16.6 0
	17.49	8		16.6 0
	17.41	8		16.6 0
	17.32	9		16.5 1

Dec 6 11 16 21 26

	m	s		
56	22.01		44	34.0 6
	21.98	3		34.5 5
	21.94	4		35.0 5
	21.89	5		35.4 4
	21.82	7		35.7 3

log cos δ 9.87288

1 cos δ sin 1' 9.99783 Jan. 9.99524 Dec.

Long δ + 0.89 + 1.34

sin 2 + .01

log I 0.44129

I 2.76

	Dec. 5 +				Dec. 14 +				Dec. 19 +				Dec. 27 +			
	m	s	m	s	m	s	m	s	m	s	m	s	m	s	m	s
	55	45.6	55	—	55	3.7	55	15.3	55	27.8	55	—	54	51.3	54	51.9
		48.0		—		6.2		18.3		30.6		—		54.0		54.8
		50.7		—		9.1		21.0		32.8		—		56.7		57.5
			44	02 38.5				26.6			24	42 18.9				3.0
			.06	41.4				29.4			.56	21.8				3.7
	55	56.3	.20	44.2	55	56.3	55	32.0	56	7.6	.60	24.6	53	32.8		8.6
		58.7	.24	47.0		58.7		34.9		9.9	.64	27.4		35.1		11.2
		1.2	.18	49.7		1.2		37.7		12.9	.68	30.2		37.7		14.0
			.16	53.2				43.2			.66	35.7				19.5
			.20	58.0				45.9			.60	38.4				22.4
			.14	0.7				48.7			.64	41.2				25.2
	55	6.33							55	30.40			54	54.00		9.38
	55	58.73	55	44.62	55	32.109			56	10.13	55	24.60	55	35.20	55	8.527

			+38.52	56	22.013	+50.45	56	21.954	+57.86	56	21.908	+1	13.68	56	21.880
			−0.51	—	3.785	−0.49	—	4.984	−.36	—	57.31		−.32	—	78.27
				—	37.96		—	49.95		—	57.42			—	73.38
			−4.48			−4.42			−4.38				−4.27		
			+33.53			+45.54			+53.11			+1	9.09		
			+17.49			+17.65			+17.71				+17.62		

			−.51			−.49			−.36						−.32	
			−3.94			+25.78		−26.62	−5.80		−45.53		+14.53		−26.67	
			0.59550n			1.41128		1.42521n	0.76343n		1.65830n		1.16226		1.42602n	
			0.39074			1.40652		1.42045	0.75867		1.65354		1.15750		1.42126	
			40 2	40	2	40 1	40	2	40 2	40	2	40	2	40	1	40 2
			17.0	.225	53.4	60.3	48.1	53.6	39.6	45.0	19.1	23.8	58.0	21	58.4	5.1	37.3	43.3
			16.4	58.1	54.0	36.7	45.6	26.1	36.5	21.3	14.9	56.4	56.3	36.0	56.6	37.2	35.8	19.2
			134	1406	94	970	137	797	161	663	130	1402	143	981	150	1023	131	625
			16.70	170.3	54.70	48.57	46.85	39.85	38.05	33.15	17.00	170.10	57.15	49.05	57.50	51.15	36.55	31.25
			42	43.50	42	51.60	41	43.35	42	35.60	42	43.55	42	53.10	41	54.32	42	33.90
			—	3.90			+	25.30	—	26.33	—	5.74	—	45.03	+	14.37	—	26.38
			42	9.60			42	8.85		9.27	42	7.81		8.07	42	8.69		7.52
			40	38.75			40	39.50		39.08	40	40.54		40.28	40	39.66		40.83

			38	21			37	50	38	43	38	21	39	00	38	01	38	41
			9.80730				9.80160		9.81170		9.80730		9.81800		9.80400		9.81170	
			+2237				+1242		+1242		+3504		+3504		+2880		+2880	
			9.82967				9.81402		9.82412		9.84234		9.85004		9.83280		9.84050	
			−0.68				−0.65		−0.67		−0.70		−0.71		−0.68		−0.69	
			−	.01			−	.18	−	.19	−	.02	−	.56	−	.06	−	.20
			−	.06			−	.53	−	.81	−	.68	−	.90	−	.61	−	.80
			+	.09			+	.07	+	.10	+	.09	+	.12	+	.08	+	.10
			−	1.26			−	1.29	−	1.57	−	1.38	−	2.05	−	1.27	−	1.59

			40	37.49			40	38.21		37.51	40	39.23		38.23	40	38.39		39.24
					+3	56.87	40	37.86	+3	57.50	40	38.73	+3	56.85	40	38.82	+3	56.81
			44	03.9		−0.1	44	34.8		−0.1	44	35.6		−0.1	44	35.8		−0.1
			+3	56.4		−33.0	+3	56.9		−34.0	+3	56.6		−34.35	+3	57.0		−35.0
				56.5	+3	23.77		57.0	+3	23.40		56.7	+3	22.35		57.1	+3	21.71

+2 2.37
− 0.2
−15.8
+1 46.37
+44 0.09

+44 1.26 +44 1.26 +44 1.08 +44 0.53

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α Arietis

α 2 0 8

δ +22° 52' 13"

+19° 30' 36"

α₀ 0 11147

Cons + .02

dα/dt + 3.3682

δ₀ 52 30 37

Cons − .0

dδ/dt + 19.221

log cos δ 9.96443

15 cos δ tan i 0.08938

tang δ + 0.412 + log

sin z + .33

log R+2 1.30078

Log I' 0.34786

log I' 9.13248

I, 2.23

I .136

R+2 19.998

1876 + −.04

Jan. 10

59 31.6 59 22.0 59 43.0 59 35.2

33.7 34.2 45.2 36.3

35.8 36.4 47.4 37.9

38.6 51.8

40.9 36.420 54.1

0 29.4 12.1 56.4 0 35.6

31.5 14.4 58.6 37.8

33.9 16.6 0.9 40.4

18.9 6.3

21.2 16.640 7.6

9.8

2653 3801

59 33.70 59 36.47

0 31.60 59 56.530 0 38.10

59 56.373

394

59 56.384

+14.94 0 11.319

− .02 − 14.93

− 14.95

−.17

+59 14.75

+ 0 11.13

+.06 +.10

Jan. 11

59 31.6 59 42.6

33.7 34.0 44.9

35.9 36.0 47.3

38.2 38.4 51.6

40.6 37.0

56.1 0 34.0

58.3 36.0

0.7 38.3

3.2

7.4

9.6

3612.0 3779

59 44.20

59 56.118 59 56.173

59 56.146

0 11.313 07

− 15.16

+ .03

+ .11 − 15.18

−.16

+14.99

+11.14

+.04

Jan. 12

59 42.1 59 31.5 59 42.5

44.7 33.7 44.8

46.3 35.9 46.9

38.2 51.5

40.5 35.960 53.6

14.7 53.9

14.0 58.2

16.2 0.4

18.3 4.8

20.7 16.180 7.0

9.3

2607 3749

59 44.20

59 56.070 59 55.902

59 55.917

0 11.295

− 15.38

− 15.40

−.15

+15.21

11.12 1113

59 30.0 59 31.1 59 42.0

32.3 33.3 44.2

34.4 35.5 46.6

37.6 47.0

39.9 37.548 53.3

0 27.8 11.5 53.5

29.8 13.6 57.6

32.0 15.8 0.0

18.0 4.6

20.0 15.770 6.7

2.0

2563 3704

59 32.23

59 55.630 59 55.491

494

59 55.492

0 11.284

+15.74

+.02 − 15.79

− 15.81

−.14

+15.62

+11.11

+.02

+.02

+.11

+2268

1.35564

1.44502

E F −3522

G H 1.54679n

1.63617n

+1968

1.29402

1.38340

−4095

1.62273n

1.71211n

+11.72

1.06893

1.15831

−40.18

1.60401n

1.69339n

+23.40 2.6

1.36661

1.45599

−34.24 38

1.53631n

1.62569n

30 1 30 2 30 1 30 2 30 1 30 2 30 1 30 2

194 26.0 30.3 35.2 22.1 25.1 38.2 39.6 34.8 35.8 36.5 38.8 19.0 20.8 27.9 29.9

236 15.5 31.5 29.0 25.1 25.0 39.6 41.8 36.9 39.0 39.1 41.8 24.1 23.8 32.2 32.2

430 41.5 18 64.2 72 178 14 117 148 156 80.6 43.1 46 60.1 62.1

21.50 20.75 30.90 32.10 23.60 25.05 38.90 40.70 35.85 37.40 37.80 40.30 21.55 22.30 30.05 31.05

31 21.62 32 31.50 31 24.32 32 39.80 31 36.62 32 39.05 31 21.92 32 30.55

+ 27.86 − 43.27 + 24.18 − 51.54 + 14.40 − 49.36 + 28.58 − 42.54

31 48.98 48.23 31 48.50 48.26 31 51.02 49.69 31 50.50 48.31

+22 50 59.37 51 0.12 50 57.85 0.09 50 57.33 58.66 50 57.85 0.04

+19 29 15 30 26 29 18 30 34 29 31 30 33 29 16 30 25

1.30910 1.30965 1.30910 1.30965 1.30920 1.30965 1.30910 1.30955

+1759 +1759 +8110 +8110 +2701 +2701 +4073 +4073

1.32669 1.32714 1.34020 1.34075 1.33621 1.33666 1.34983 1.35028

−21.22 −21.24 −21.89 −21.92 −21.69 −21.71 −22.38 −22.40

− .10 − .24 − .08 − .35 − .03 − .31 − .10 − .23

− .09 − .18 − .10 − .18 − .11 − .18 − .10 − .20

+ .05 + .10 + .06 + .11 + .06 + .12 + .05 + .10

−21.36 −21.56 −22.01 −22.34 −21.77 −22.08 −22.53 −22.73

+22 + 50 38.01 38.56 50 37.84 37.75 50 35.56 36.58 50 35.32 37.31

50 38.28 +2 2.37 50 37.79 +2 4.04 50 36.07 +2 3.98 50 36.32 +2 3.91

52 40.3 − .07 52 40.3 − .8 52 40.3 − .8 52 40.4 − .8

+2 2.0 − +9.9 +2 2.5 − +9.9 +2 4.2 − +9.9 +2 4.1 − +10.1

2.0 +1 51.77 2.5 +1 53.34 4.2 +1 53.28 4.1 +1 53.01

22 +52 29.65. 3006 +52 31.13 +52 29.35 +52 29.33

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ζ Persei

2 m 5 s 18
+50 ° 29 ' 1 "
1876 − 8° 06' 13"

λ_0 5 m 2 s 21.987
Long + .07
$\frac{d\lambda}{dt}$ + 3.9502
β_0 29 ° 17' 19.98"
Long + .5
$\frac{d\beta}{dt}$ + 16.946

log cos β 9.80366
15 Constant 9.92861 Jan.
9.92602 Dec.
tang β + 1.21 + 1.57
sin z − .14

Jan 1 6 11 16 21 26
Dec 6 11 16 21 26

	Jan. 1	6	11	16	21	26
m	5	5	5	5	5	5
	22.19	22.04	21.94	21.84	21.73	
	10	10	10	11		
	29	29	29	29		
	36.0 1	36.1 1	36.2 1	36.3 1	36.5 2	

	Dec. 6	11	16	21	26
m	5	5	5	5	5
	26.90	26.86	26.80	26.73	26.66
	4	6	7	7	
	29	29	29	29	29
	51.9 7	52.6 7	53.3 7	53.9 6	54.4 5 4

	Jan. 13	Dec. 6 +	Dec. 19 +	Dec. 24 +	Dec. 27 +
	+.05	−.59	−.41	−.42	−.36
m	4 47.4	4 47.0	4 1.3	4 28.3	3 59.0
	49.4	50.0	4.7	31.5	1.7
	52.6	53.3	6.5	34.7	4.5
		53.8		41.2	
		2.8		44.6	
	5 46.0	6.0	5 12.1	47.7	4 54.6
	48.8	9.2	14.9	50.9	57.3
	51.7	12.6	18.0	54.1	59.8
		19.3		6.7	
		22.4		8.9	
		25.6		7.3	
		3080		3449	
	4 49.60	6.80	4 4.17	52.49	4 1.73
	5 48.83	5 6.98 182	5 15.00	4 47.78	4 57.23
	+15.75	5 21.895	+4.01	5 26.898	+57.86
	+.06	− 15.71	−.71	− 39.18	−.50
		− 15.78		− 39.25	
	+.09		−4.91		−4.77
	+15.90		+34.39		+52.59
	+5 22.08		+22.12	22.11	+22.03
	+16.38	+.06		−.71	
	1.21431				
	1.14292				
		−42.685	+43.35	−27.28	+27.71
ε		1.62992n	1.63899	1.43584n	1.44264
G		1.55853n	1.56501	1.36186n	1.36866
		55 0	55 1	33 1	33 2
		7.2 10.3	57.5 59.3	25.1 30.9	26.2 30.9
		16.5 9.6	64.1 60.0	27.5 8.0	25.9 7.6
		23.7 19.9	121.6 119.3	12.6 38.9	52.1 38.5
		1185 9.95	0.80 59.65	26.30 19.45	26.05 19.25
		55 10.90	56 10.22	56 22.88	57 22.65
		+ 13.90	− 36.19	+ 36.73	− 23.01
		55 24.80	56 24.03	56 59.61	59.64
		+50 27 23.55	24.32	25 48.74	48.71
		−8 16 55	6 6	7 30	6 30
		0.91440	0.91370	0.91500	0.91405
		+40 80	+40 83	+17 40	+35 09
		0.95523	0.95453	0.93240	0.93145
		+9.02	+9.01	+8.56	+8.54
		− .07	− .48	− .51	− .20
		− .02	− .08	− .42	− .72
		+ .01	+ .04	+ .06	+ .10
		+ 8.94	+ 8.49	+ 7.69	+ 7.72
		27 32.40	32.81	25 56.43	56.43
		27 32.65	+ 2 3.91	25 56.43	+ 3 56.84
		29 36.2	+ 0.1	29 51.9	+ 0.3
		+ 2 3.5	− 18.2	+3 55.5	− 33.9
		4.0	+ 1 45.81	56.0	+ 3 23.24
		50	+29 18.46		+29 19.67

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4 Vesta Mins.

14h 9m 23s Coord

+78° 8' 5" dx/dt

−35° 45' 17" δ0

+101° 51' 6.5" Coord

−58° 29' 07" dδ/dt

1876 +

Jan 13 +.06

Dec. 6 −.59

Dec. 19 −.41

Dec. 24 −.42

Dec. 27 −.36

log cos 9.31310

15 cos Stan i 9.43805n 9.43546n Jan Dec.

tang δ −4.76 −4.85

sin z −.85

log I 1.50119

I 1003

1/2 I 502

Jan 11.8 2284 56 7 22.8 7

16 2340 56 22.1 7

21 2396 21.6 5

Dec 6 19.3 36 7 12.9 17

11 19.49 40 11.3 16

16 19.89 43 9.8 15

21 20.32 47 8.4 14

26 20.79 7.1 13

8	17.1	8	47.3	8	0.7	8	16.0	7	57.0	8	0.1	7	57.4	7	50.4	6	54.3	7	45.4
	23.6		51.6		8.8		20.8		2.0		5.4		8.3		55.4		3.5		50.3
	36.6		56.9		18.3		26.0		10.8		10.2		19.7		0.1		9.8		53.0
			1.9				30.5				15.0				5.4				0.4
			7.2				36.0				20.0				10.4				5.4
9	38.5		11.7	9	8.3		41.2	8	46.9		24.9	8	32.8		15.4	8	30.8		10.7
	45.2		17.1		14.0		46.4		52.3		30.0		43.9		20.4		37.0		15.9
	53.8		22.0		27.6		51.3		7.4		34.9		48.6		25.2		48.4		20.4
			26.7				56.0				40.2				30.1				25.3

			2421				3242				1807				2128				2288
8	25.77		6.21	8	9.60	8	1.27	8	8.47					7	92.87	7	2.53		4.88
9	45.83	9	6.900	9	16.63	8	36.022	8	57.077	8	20.078	8	41.77	8	10.311	8	38.73	8	5.422
	+15.75	9	23036		+40.02	9	19112		+57.86	9	20127	+1	8.03	9	20578	+1	13.69	9	20869
	−.28		−1614		+.251		−43089		+1.95		−6405		+2.00		−7027		+1.71		−8545
			−1589				−4284				−5980				−7002				−7520
	−.169				+2.823				+9.81				+1.36				+1.07		
	+14.38				+15.66			+1	1.62			+1	11.39			+1	16.47		
+9	21.28				+21.68				+21.70				+21.70				+21.89		

+4.113
1.61416
1.05221n

+.28 +2.81 +1.95 +2.00 +1.71

			−38.93		+26.42		−20.61		+18.81		−36.99		+1.84		−31.46		+62.89		−33.31
			1.59028n		1.42193		1.60863n		1.27439		1.56808n		0.26482		1.49776n		1.79858n		1.52257n
			1.02833		0.85739n		1.04409		0.70985n		1.00354		9.70028n		0.93322		1.23404n		0.95803
		'		'		'		'		'		'		'		'		'	
		30	4	30	3	35	0	35	0	35	0	35	0	35	0	35	0	35	0
		"		"															
		147	198	52.9	57.3	52.8	57.2	34.8	41.3	32.6	0.4	36.8	44.3	43.5	53.3	37.7	44.7	57.5	9.2	33.7	42.4
		23.1	14.5	39.2	33.7	33.3	30.8	36.8	14.3	33.6	27.8	38.3	16.0	46.1	21.8	38.8	13.7	3.3	38.2	22.6	14.4
		37.8	34.3	111.1	111.0	83	90.0	116	55.6	62	88.2	151	60.3	116	75.1	165	66.4	1728	107.4	703	56.8
		18.90	17.15	55.55	55.50	54.15	45.00	35.80	27.80	53.10	44.10	37.55	30.15	45.80	37.55	38.25	30.20	61.40	53.70	35.15	28.40
		'		'		'		'		'		'		'		'		'		'	
		34	18.2	33	55.52	35	40.58	35	31.80	35	48.60	35	33.85	35	41.68	35	34.22	35	57.55	35	31.78
		−	11.28	+	10.67	−	7.20	+	11.07	−	5.13	+	10.08	−	0.50	+	8.57	−	17.14	+	9.08
		34	6.92		6.19	35	42.38		42.87	35	43.47		43.93	35	41.18		42.79	35	40.41		40.86
+108		48	41.61		42.16	47	5.97		5.48	47	4.88		4.42	47	7.17		5.56	47	7.94		7.49

−58		27	48	28	10	28	03	28	21	28	04	28	19	28	11	28	19	27	55	28	21
		1.97	88 24	1.97	88 21	1.97	88 24	1.97	88 24	1.97	88 18	1.97	88 24	1.97	88 24	1.97	88 24	1.97	88 12	1.97	88 18
			+.4089		+.4089		+1742		+1742		+3512		+3512		+4032		+4032		+2909		+2909
		2.0	2.2898	2.0	2.2964	2.0	2.3055	2.0	2.3055	2.0	2.3026	2.0	2.3026	2.0	2.2857	2.0	2.2856	2.0	2.1721	2.0	2.2733
			+10		+10		+10		+10		+10		+10		+10		+10		+10		+10
			2.1		2.1		1.9		2.1		2.1		2.1		2.1		2.1		2.1		2.1
		+	.19	+	.17	+	.07	+	.19	+	.04	+	.15	+	.00	+	.11	+	.44	+	.12
		−	.34	−	.31	−	.24	−	.15	−	.25	−	.19	−	.22	−	.24	−	.32	−	.16
		+	.17	+	.16	+	.03	+	.02	+	.03	+	.02	+	.03	+	.02	+	.04	+	.02
			6.97		6.97		41.15		41.27		45.32		46.07		46.74		46.74		44.20		44.08
		+1	48 41.44	+1	43.13	+1	2.75	+1	3.07	+1	1.63	+1	2.84	+1	2.84	+1	2.84	+1	48.20	+1	48.08
+101		50	24.42		24.99	48	43.22	41	42.65	48	46.15	50	45.86	48	48.66	53	48.18	48	48.14		47.53
		50	24.76	+2	25.13	48	43.58	+3	42.84	48	46.50	+3	45.85	48	48.42	+3	48.58	48	47.84	51	47.81
		7	22.5		3.81	7	12.8		1.7	7	8.7		1.7	7	7.6		1.7	7	6.8		1.6
		52	37.4		47.0	52	47.0		46.0	62	51.0		46.0	52	52.3		46.3	52	53.1		46.1
		+ 2	12.7		3.9	+ 4	3.9		35.0	+ 4	5.0		37.0	+ 4	3.4		37.0	+ 4	5.3		37.0
			11.9		3.1			+ 3	23.54		4.2	+ 3	19.55		2.6	+ 3	17.67		4.5	+ 3	17.31

101				+52	4.81			+52	8.63			+52	5.55			+52	6.59			+52	5.15
					8.94				10.52				9.61				10.70				9

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o Ceti

2 13 2

− 3° 32' 47"

+ 45° 55' 35"

α_0 13 4953

Corr + .02

$\frac{d\alpha}{dt}$ + 3.0260

δ_0 32 30.37

Corr − .4

$\frac{d\delta}{dt}$ + 16.524

1876

Dec 6 11 16 21 26

13 9.02 8.99 8.77 8.96 8.43 8.90

3 3 3 3

32 7.8 8.3 8.1 9.2 9.6

5 4 5 4

log cos δ 9.99917

15 cos δ tan i 0.12153

I 20.7

tang δ − 0.06 + 1.00

sin z + .72

	Dec. 6 +	Dec. 19 +	Dec. 24 +	Dec. 27 +
	−.59	−.41	−.42	−.36
	2h 11m 58.7	11m 56.7	11m 48.7	11m 50.1
	0.5	57.4	50.8	52.0
	2.0	58.0	52.7	54.3
		0.1	56.9	55.34 57.2
			59.0	.07 53.0
	12m 16.7	11m 57.7	11m 49.0	11m —
	18.8	58.0	51.0	52.0 —
	20.8	58.1	52.2	54.3 —
	24.9	0.8		
	27.0	2.9		
	29.0	7.0		.10 55.1
	31.0	9.0		.03 57.1
	33.0	11.1	12 30.3	12 34.4 .06 59.2
	37.3	13.0	32.0	35.9 .12 8.4
	39.4	15.2	34.2	37.8 .25 5.6
	41.4	19.3		.28 7.7
		21.4		
		23.5		
	3193	1819	3110	
12 0.401	29.027	11 58.38	11 50.73	11 52.13
	12 29.027	12 47.47	12 11.082	12 32.17 12 1.000 12 36.03 11 55.156
	+4902	+57.88	+1 8.04	+1 13.70
	13 9.018	13 8.940	13 8.910	13 8.892
	+.03	+.02	+.02	+.02
	− 39.99	− 57.86	− 67.91	− 73.44
	− 40.01	− 57.88	− 67.93	− 73.76
	−4.06	−3.99	−3.95	−3.98
	+35.99	+53.91	+1 4.11	+1 9.78
	+13 5.92	+ 4.99	+ 5.11	+4.90 +4.94
	+.03	+.02	+.02	+.02
	+ 28.63	+ 12.70	− 36.39	+ 10.27
	1.45682	1.10380	1.56098n	1.01157
	1.57835	1.22533	1.68251n	1.13310
	− 31.17	+ 3.03	− 40.87	
	1.49374n	0.48144	1.61140n	
	1.61527n	0.60297	1.73293n	
	55 2	55 2	55 3	55 2 55 3
	15.9 16.8			
	12.9 59.7	37.6 40.2	40.7 42.8	38.1 40.8 31.4 32.7 50.9 52.3 47.8 49.4
	88 1365	82.8 18.2	86.1 26.1	34.9 18.4 26.8 13.8 46.2 33.3 42.0 32.3
	14.40 8.25	104 584	168 689	130 592 582 465 971 856 898 817
		35.20 29.20	38.40 34.48	36.50 29.60 29.10 23.25 48.55 42.80 44.90 40.85
	57 11.32	57 32.20	58 36.42	58 7 33.05 58 26.18 57 45.68 58 42.87
	+ 37.87	+ 16.80	− 48.14	+ 13.58 − 41.24 + 4.01 − 54.07
	57 49.19	57 49.00	48.28	58 7 46.63 44.94 57 49.69 48.80
+5 −3	35 0.84	35 0.65	59.93	35 4 58.28 54.59 35 1.34 0.45
−8 45	53 18	53 39	54 43	53 40 54 33 53 53 54 50
	1.77325	1.77330	1.77360	1.77380 1.77363 1.77340 1.77365
	+1747	+3515	+4036	+4086 +2917 +2917
	1.79072	1.80845	1.80875	1.81366 1.81391 1.80257 1.80282
	−61.76	−64.34	−64.38	−65.11 −65.15 −63.47 −63.51
	+ .03	+ .01	+ .04	+ .00 + .04 + .00 + .06
	− .66	− .78	− 1.12	− .80 − 1.22 − .90 − 1.18
	+ .09	+ .10	+ .14	+ .10 + .14 + .11 + .15
59 −3	−102.30	−1 5.01	−1 5.32	−1 5.81 −1 86.06 −1 4.26 −1 4.48
	36 3.14	36 5.66	5.25	36 4.09 2.65 36 5.60 4.93
	+3 56.84	36 5.45 +3	56.85	36 3.37 +3 56.27 36 5.27 +3 56.81
	− 32' 7"8	− 1.6 32	9.0 − 1.5	32 9.51 − 1.5 32 9.7 − 1.5
	+3 55.3	− +22.6 +3	56.4 − +21.4	+3 53.9 − +20.9 +3 55.6 − +20.7
	54.9	+3 32.64	56.0 +3	35.95 58.5 +3 33.87 55.2 +3 34.61
	−3	−32 31.50	−32 31.50	−32 32.50 −32 30.66
		30.50		29.50

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i Cassiop. α_0 18 52219 m s

h m s
2 18 47 coord + .26 Jan 1 18 52.55 50 56.1 5
+66° 50' 18" $\frac{d\alpha}{dt}$ + 4.8416 6 52.35 18 56.6 5
$\frac{d\delta}{dt}$ + 16.455 11 52.16 19 57.1 5
16 51.96 20 57.4 3
21 51.76 20 57.7 3
−24° 27' 30" δ_0 50 34.91

coord + .8 Dec. 6 18 58.61 57 9.4
11 58.53 8 10.5 11
16 58.42 11 11.6 11
21 58.29 13 12.6 10
26 58.14 15 13.5 9

log cos δ 9.59455
log cos tang 9.71950 Jan.
9.71691 Dec.
tang δ + 2.54
sin z − .41

1876
+ +.04 + +.05 −.59 −.39 −.42 −.36
Jan. 12 Jan. 13 Dec. 6 + Dec. 23 + Dec. 24 + Dec. 27 +

17	43.2	18	5.4	17	46.7	18	4.9	17	11.9	18	9.7	17	17	17	42.8	17	10.7	17	40.6	17	11.5	17	38.8
	42.1		10.7		51.2		10.0		16.3		12.4		5.2		45.3		16.0		43.7		14.0		37.5
	52.0		15.9		57.1		15.4		20.7		15.3		11.2		47.7		20.6		46.2		18.0		40.2
			26.2				25.8				17.8				50.6				48.8				42.9
			31.7				31.1				20.4				53.2				51.3				43.5
19	14.9	18	37.0	19	17.2	18	36.7	18	34.4	18	22.9	18	6.9	18	53.6	18	9.2	18	54.1	18	5.3		48.0
	21.6		42.1		21.0		41.9		40.5		25.5		10.7		58.4		13.0		56.6		9.7		50.7
	26.4		47.3		28.2		47.2		46.0		28.0		16.3		1.0		18.2		59.2		14.0		53.1
			52.0				52.4				30.6				3.6				1.8				55.3
			32				2.6																
			83				8.0																
			2858				2810				1826				3582				4023				4082
17	47.3		40.58	17	51.67		40.10	17	16.30			17	6.03 2.78		47.82	17	15.77		46.23	17	14.50		
19	20.97	18	36.891	19	22.13	18	36.455	18	40.30	18	202 89	18	11.30	17	53.133	18	13.47	17	51.366	18	9.67	17	45.355
	+15.36	18	52110	+15.75		18	52070	+40.02		18	58606	+1	6.19	18	58222	+1	8.04	18	58192	+1	13.71	18	58100
	+.09		− 15.22	+.12			− 15.62	−1.38			− 38.32		−.91		− 65.09		−.98		− 67.82		−.84		− 72.74
			− 15.48				− 15.88				− 38.58				− 65.35		−5.97		− 67.08		−5.88		− 73.00
	+ .11			+ .15				+6.39					−6.00			+1	1.09			+1	6.99		
	+15.55			+16.02				+32.25					+59.28				+52.46				+52.35		
	+18 52.44			+52.48				+52.54					+52.41										

	+49.46		+.09		+.12		−1.38		−.91		−.98		−.84						
	1.69425																		
	1.41375																		
			−44.08		+44.789		−45.687		+63.99		−20.01		+47.10		−18.17		+35.60		−22.10		+30.856		−24.321
E	F		1.64424n		1.65118		1.65963 n		1.80611		1.30125 n		1.67302		1.25035 n		1.55145		1.34439 n		1.48940		1.38578 n
G	H		1.36374n		1.37068		1.37913n		1.52302		1.01816n		1.38993		0.47626n		1.26836		1.06130 n		1.20631		1.10269n
'	'																						
30	3	30	4	30	3	30	4	35	0	35	1	35	0	35	1	35	0	35	1	35	0	35	1
53.5	57.8	43.2	47.7	57.9	2.1	45.2	48.1	32.1	38.6	16.8	23.2	41.0	48.2	14.0	22.2	45.1	53.1	14.0	22.2	47.1	56.0	17.2	23.7
57.3	52.9	46.2	40.2	1.6	56.2	49.2	44.4	31.9	12.5	15.2	36.7	39.9	15.5	12.2	52.6	44.4	22.4	13.8	53.7	46.2	24.6	15.1	55.9
1108	1105	89.4	87.9	119.5	118.3	94.1	92.5	40	51.1	120	139.9	80.9	63.7	62	134.8	95	75.5	98	125.9	133	80.6	323	179.6
55.40	55.25	44.70	43.95	59.75	59.18	47.20	46.25	32.00	25.55	16.00	69.95	40.45	31.85	13.10	67.40	44.75	37.75	14.90	62.95	46.65	40.30	16.15	64.80
															10.25								9.129
33	53.38	34	44.32	33	59.48	34	46.72	35	28.78	36	42.98	35	36.15	36	37.75	35	41.25	36	38.92	35	43.48	36	40.48
+	25.93	−	23.11	+	23.48	−	23.94	+	33.35	−	10.43	+	24.54	−	9.47	+	18.55	−	11.52	+	16.08	−	12.67
34	21.31	34	21.21	34	22.93		22.78	36	2.13		2.55	36	0.69		0.78	35	59.80		57.40	35	59.56	36	0.31
+66	48 27.04		27.14	48	25.42		25.57	46	46.22		45.80	46	47.66		47.57	46	48.55		50.95	46	48.79		48.04
								28	34									27	
−24	28 11	27	22	28	07	27	19	26	37	27	40	28	17	27	43	28	12	27	44	28	16	27	40
	1.41885	1.41800		1.41835		1.41800		1.41840		1.41820		1.41840		1.41820		1.41835		1.41820		1.41835		1.41820	
	+2780	+2780		+4105		+4105		+1755		+1755		+3492		+3492		+4043		+4043		+2984		+2934	
	1.44565	1.44530		1.45740		1.45705		1.43595		1.43575		1.45332		1.45312		1.45878		1.45863		1.44769		1.44754	
	+27.90	+27.88		+28.80		+28.78		+27.29		+27.27		+28.40		+28.39		+28.76		+28.75		+28.03		+28.02	
	− .47	− .38		− .40		− .41		− .80		− .08		− .43		− .06		− .24		− .09		− .18		− .11	
	− .27	− .33		− .32		− .38		− .15		− .36		− .19		− .38		− .22		− .35		− .22		− .38	
	+ .16	+ .19		+ .16		+ .19		+ .02		+ .05		+ .02		+ .05		+ .03		+ .04		+ .03		+ .05	
	+27.32	+27.36		+28.24		+28.18		+26.36		+26.88		+27.80		+28.00		+28.33		+28.35		+27.66		+27.58	
+66	48 54.36		54.50	48	53.66		53.75	47	12.58		12.68	47	15.46		15.57	47	16.88		19.30	47	16.45		15.62
	48 54.43	+2	3.98	48	53.70	+2	3.91	47	12.63	+3	56.84	47	15.52	+3	56.58	47	16.40 1688			47	16.03	+3	56.81
	50' 57.2		+.7	50	57.2		+.7	51	9.5		+.7	51	13.0		+.7	51	13.2	+3	56.27	51	13.7		+.8
	+2 2.8		−22.3	+2	3.5		−22.3	+3	56.9		−34.6	+3	57.5		−38.1	+3	56.3		+.7	+3	57.7		−38.5
	3.6	+1	42.38		4.3	+2	42.31		57.7	+3	22.94		58.3	+3	19.18		57.1		−38.3		58.5	+3	18.81
																		+3	18.67				
66		+50	36.81			+50	36.01			+50	34.67			+50	34.70			+50	35.55			+50	34.81

35,39

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ε² Cet

α₀ 21 34m 50s

δ₀ +7° 53' 54"

Cons + .06

dα/dt + 3.1811

dδ/dt + 16.340

log cos δ 9.99586

15 Constant 0.12081 Jan 1876
0.11822 Dec 76 Jan 77 208

Tang δ + 0.14 +4.01

sin z + .57

1876 + .04 Jan 2

Dec 6 + −.59

Dec 23 + −.39

Dec 24 + −.42

Dec 27 + −.36

1877 −.40 Jan 2 +

	Jan		Dec 6		Dec 23		Dec 24		Dec 27		1877 Jan 2	
α	21 28.9	21 —	20 57.5	20 45.8	20 12.2	20 19.6	20 6.3	20 17.7	20 2.7	20 12.0	20 7.7	20 2.7
	30.8	—	53.7	47.9	18.8	21.6	8.2	19.7	4.7	14.0	9.8	4.8
	32.9	—	53.5	50.1	13.1	23.7	9.5	21.8	6.9	16.2	11.7	6.9
		—		54.2		27.9		26.0		20.4		11.1
		—		56.3		30.0		28.1		22.3		13.2
	1910 19.1		20 58.3	58.3	20 53.9	32.0	20 47.2	30.1	20 42.9	24.4	20 37.0	15.2
	.02 21.1			0.4	57.3	34.1	49.5	32.2	45.0	26.6	33.4	17.2
	.14 23.3			2.4	58.7	36.1	51.2	34.3	47.2	28.5	34.3	19.3
	.08 27.4			6.7		40.3		38.6		32.8		23.6
	.10 29.5			8.8		42.5		40.6		34.8		25.6
	.12 31.6			10.9		44.6		42.7		37.0		27.7
				33 18		33 24		33 18		26 90		16 73
	21 30.57		20 53.57	6318	20 13.70	32.036	20 8.00	30.164	20 4.67	24,455	20 9.73	52.57
		21 19.093		28 5.436	20 57.30	33.854	20 49.30		20 45.03		20 52.57	20 15.209
				0 88.345								
	+15.35	21 34.398	+4.03	21 38.179	+1 6.20	21 38.106	+1 8.05	21 38.100	+1 13.71	21 38.082	+1 22.98	21 38.032
	+.00	− 15.30	−.08	− 39.83	−.05	− 66.07	−.06	− 67.94	−.05	− 73.63	−.06	− 82.82
		− 15.36		− 39.89		− 66.13		− 67.99		− 73.69		− 82.88
	−.39		−4.17		−4.10		−4.09		−4.07		−4.02	
	+14.76		+35.45		+1 2.05		+1 3.96		+1 9.59		+1 18.90	
	+21 34.05		+34.12		+34.09		+34.06		+34.05		+34.11	
		+.00		−.08		−.05		−.06		−.05		−.06
		−11.78		+4.77		+18.34	−25.26	+22.16	−19.14	+19.78	−20.58	+5.48	−37.36
ε	ℋ	1.07114		0.67852		1.26340	1.40243	1.34557	1.28194	1.29623	1.31344	0.73878	1.57241
ζ	ℋ	1.19195		0.79674		1.38162	1.52065	1.46379	1.40016	1.41445	1.43166	0.85700	1.69063
				30 1	30 2	30 1	30 2	30 0	30 1	30 1	30 1	30 1	30 2
			22.9	26.7	8.3 106	4.9 9.1	2.5 7.2	57.6 3.2	53.3 56.3	4.9 8.3	37.2 39.7	23.0 27.3	18.7 21.3
			22.2	10.2	4.7 54.3	2.8 45.4	0.0 47.7	56.5 40.2	44.7 36.9	2.1 48.0	58.8 43.2	20.0 4.2	14.4 2.8
			46.1	36.9	13.0 12.49	7.7 18.45	2.5 13.49	1.41 10.34	1.020 93.2	7.0 11.63	11.0 10.29	4.30 3.15	1.31 2.41
			2255	18.45	6.50 62.45	3.85 57.25	1.25 57.45	57.05 51.70	51.00 46.60	3.50 58.15	55.50 51.45	21.50 15.75	16.550 12.05
			31	20.50	32 34.48	31 30.55	32 29.35	30 54.38	31 48.80	31 30.82	31 53.48	31 16.62	32 38.78
				+ 6.26		+ 24.08	− 33.16	+ 29.09	− 25.13	+ 25.97	− 27.02	+ 7.19	− 49.05
			31	26.76	31	24.63	26.19	31 23.47	23.67	31 26.79	26.46	31 25.81	25.25
			51	21.59	51	23.72	22.14	51 24.88	24.68	51 21.56	21.89	51 22.54	23.10
			27	28	27	08	27	01	27	56	27	08	28	08	27	26	28	21
			1.59665		1.59645		1.59670	1.59640	1.59665		1.59645	1.59670	1.59650		1.59680	
			+1757		+3499		+3499	+4047	+4047		+2943	+2943	+2928		+2928	
			1.61414		1.63144		1.63167	1.63687	1.63712		1.62588	1.62613	1.62578		1.62608	
			−41.13		−42.80		−42.82	−43.84	−43.86		−42.25	−42.28	−42.25		−42.27	
			− .00		− .02		− .06	− .04	− .03		− .03	− .03	− .01		− .10	
			− .39		− .32		− .64	− .29	− .58		− .32	− .61	− .39		− .66	
			+ .05		+ .04		+ .08	+ .04	+ .07		+ .04	+ .08	+ .06		+ .09	
			− 41.47		− 43.10		− 43.43	− 43.63	− 43.90		− 42.56	− 42.84	− 42.60		− 42.92	
			50 40.12		50 40.62		38.73	50 41.25	40.78	50 39.00	39.05	50 39.94	40.16	
					50 39.68		+3 56.58	50 41.02	+3 56.2	50 39.02	+3 56.81	50 40.05	+3 56.74	
			54' 36.3		54 35.4		−1.2	54 35.3	−1.2	54 35.1	−1.2	54 34.8	−1.5	
			+3 56.2		+3 55.7		−+24.2	+3 54.3	−+24.1	+3 56.1	−+23.9	+3 54.7	−+23.7	
			56.4		55.9		+3 31.18	54.5	+3 30.97	56.0	+3 31.71	54.9	+3 31.54	
			+54 12.08		+54 10.72		+54 10.86		+54 17.99		+54 10.73		+54 11.57	

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36 Hb Cassiop. 1876

| | | |

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γ Aquilae

α 19h 43m 31s.4688 — δ +21° 25′ 10″ — 1876.0

α_0 19h 43m 31s.4688 — δ_0 +21° 25′ 25″.568

	Jan	Dec
cond	−.02	+.8
$\frac{d\alpha}{dt}$	+3.3946	+15.794
$\frac{d\delta}{dt}$		

| | Jan | Dec | | |

1876phae.proj.1481.

δ Ceti

α_0 2 m 33 s 5

Const $\frac{d\alpha}{dt}$ − .01 + 3.0714

δ_0 − 11° 12′ 43″ 0 + 42 35 31

Const $\frac{d\delta}{dt}$ − .2 + 15.731

log cos δ 0.00000

1 Const Stars 0.12236

tang δ −0.00 + 1.00

sin z + .68

1876 1877

Dec. 19 ×	Dec. 23 ×	Dec. 24 ×	Dec. 27 ×	Jan. 2 ×
−.41	−.39	−.42	−.36	−.40
2 31 50.2 57.9 54.0	31 44.8 46.5 48.0	31 53.0 55.2 57.3 14 35	31 35.8 37.2 39.4	31 37.5 53.5 53.6 59.6 1.7	31 36.4 38.5 40.9	31 45.3 47.8 49.7 53.8 3.60	31 25.8 27.1 30.3	31 36.4 38.4 40.4 44.6 46.7
32 31.2 33.5 35.1	32 42.4	32 39.0 40.6 43.2	32 33.5 35.6 37.8	32 13.5 15.4 17.9	32 48.5 50.8 52.8 55.0
31 52.03	31 46.43	31 37.47	31 38.60	31 27.93
32 33.27	32 13.836	32 42.40	32 5.545	32 40.93	32 37.545	32 35.63	31 58.062	32 16.57	31 48.709
+57.90	33 11.797	+1 6.21	33 11.781	33+1 8.06	33 11.777	+1 13.73	33 11.765	+1 22.99	33 11.741
t.00	− 57.96	t.00	− 66.24	t.00	− 68.02	t.00	− 73.68	t.00	− 83.03
	− 57.95		− 66.23		− 68.01		− 73.67		− 83.02
−4.11	−4.09	−4.09	−4.08	−4.05
+53.79	+1 2.12	+1 3.97	+1 9.65	+1 18.94
+33 7.63	+7.66	17.72	+7.73	+7.65
+21.81	t.00	t.00	t.00	t.00
1.33866				
1.46102				
	− 19.43	+ 19.11	− 36.86	+ 26.28 −37.18	+ 19.48	− 37.55	+ 20.778	− 26.876
Eq.	1.28847n	1.28126	1.56636n	1.77866	1.28959	1.57461n	1.31765	1.42916n
Eq. No.	1.41083n	1.40362	1.68892n	1.96102 4.65266 1.69247n	1.41195	1.69697n	1.44001	1.55146n
35 2	35 3	35 2	35 3	35 2	35 3	35 2	35 3	35 2	35 3
29.3 21.8	24.3 25.2	31.7 35.1	47.8 48.2	22.9 25.2	47.0 48.0	32.9 34.6	47.8 48.6	31.9 34.0	34.3 34.8
24.0 7.9	16.8 8.3	29.1 12.6	40.7 30.0	18.9 1.7	41.3 27.7	28.8 14.7	41.6 31.6	26.9 10.4	28.4 14.6
533 39.7	41.1 30.5	60.8 47.7	88.5 78.2	41.8 26.9	88.3 75.7	61.7 49.3	89.4 80.2	58.8 44.4	62.7 49.4
20.65 19.85	20.55 15.25	30.40 23.85	44.25 39.10	20.90 13.45	44.15 37.85	30.55 24.65	44.70 40.10	29.40 22.20	31.35 24.70
37 23.25	38 17.90	37 27.12	38 41.68	37 17.18	38 41.00	37 27.75	38 42.40	37 25.80	38 28.02
+ 28.91	− 25.45	+ 25.33	− 48.86	+ 31.53	− 49.28	+ 25.82	− 49.77	+ 27.54	− 35.60
37 52.16	5 + 2.25	37 52.45	52.82	37 52.01	51.72	37 53.57	52.63	37 53.34	52.42
4 56.19	3.90	15 4.10	4.47	15 3.66	3.37	15 5.22	4.28	15 4.99	4.07
15 3.81									
33 30	34 25	33 34	34 49	33 24	34 48	33 35	34 49	33 33	34 35
1.72285	1.72305	1.72290	1.72315	1.72285	1.72315	1.72290	1.72315	1.72290	1.72310
+3534	+3534	+3561	+3561	+4061	+4061	+2978	+2978	+2949	+2949
1.75819	1.75839	1.75851	1.75876	1.76346	1.76376	1.75268	1.75293	1.75239	1.75259
−57.80	−57.83	−57.85	−57.85	−58.00	−58.04	−56.68	−56.61	−56.54	−56.587
+ .00	+ .00	+ .00	+ .00	+ .00	+ .00	+ .00	+ .00	+ .00	+ .00
− .74	− 1.02	− .78	− 1.18	− .74	− 1.18	− .80	− 1.18	− .72	− 1.05
+ .10	+ .13	+ .10	+ .15	+ .09	+ .15	+ .10	+ .15	+ .10	+ .14
−57.94	−58.22	−58.03	−58.41	−58.65	−59.07	−57.28	−57.44	−57.16	−57.48
16 1.75	2.12	16 2.13	6.06 14 5.01	4.30 14 4.44	16 4.59	6.61 14 1.92	7.83 14 2.15	6.59
16 1.94	+ 3 56.85	16 2.50	2.88 16 2.31	2.44 16 2.38	16 2.25	16 1.85	+ 3 56.74
12 5.15	− 1.4	12 5.8	+ 3 56.58	12 5.9	+ 3 56.27	12 6.2	+ 3 56.81	12 6.8	− 1.8
+ 3 3.6	− +21.9	+ 3 56.7	− 1.4	+ 3 56.5	− 1.4	+ 3 56.1	− 1.4	+ 3 55.1	− +20.6
56.4	+ 3 33.55	56.5	+ 3 +21.6	56.3	− +21.5	55.9	− +21.2	54.9	+ 3 34.34
			+ 3 33.58		+ 3 33.37		+ 3 34.21		
−12 28.20	−12 28.92	−12 29.01	−12 28.04	−12 27.51
2439				

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A. Persei

α 2 35 40
δ +48° 41' 53"
1876 Jan 20

α 2 35 40
δ +48° 41' 53"
1876 Dec. 19

α 2 35 44262
δ +48° 42' 8"36
1876 Dec. 23

α 2 35 44262
δ +48° 42' 8"36
1876 Dec. 24

α 2 35 44262
δ +48° 42' 8"36
1876 Dec. 27

	Jan 1	6	11	16	21	26
α	35 44.72	44.64	44.55	44.46	44.36	
	8	9	9	10		
δ	42 26.0	26.3	26.5	26.7	26.9	
	3	2	2	2		

	Dec 6	11	16	21	26
α	35 49.50	49.47	49.46	49.39	49.34
	3	3	5	5	
δ	42 39.8	40.6	41.3	41.9	42.5
	8	7	6	6	5

log cos δ 9.81955
15 cos δ sin z 9.94450 Jan
9.94191 Dec. I 3.12
tang δ +1.14 +1.52
sin z − .11

	Dec. 19	Dec. 23	Dec. 24	Dec. 27
	− .06	− .41	− .39	− .42	− .36
α	34 37.2	34 21.6	34 33.2	34 34.1	34 24.8	34 44.4	34 23.0	34 28.5	34 17.6
	46.0	23.8	36.4	37.8	27.9	47.0	26.1	40.8	20.6
	42.6	24.7	39.5	41.0	30.9	49.5	29.2	43.0	23.7
			45.8		37.4		35.5		29.9
			49.0		40.6		38.6		32.9
	35 37.3	35 13.0	52.0	35 13.0	43.7	35 9.3	41.9	35 15.0	36.2
	53.3	16.1	55.0	16.1	46.9	11.7	44.7	17.2	39.2
	58.0	18.8	58.1	18.8	50.0	14.4	48.0	20.9	42.6
			46		54.1		51.3		48.6
			77		57.4		54.4		51.8
			10.8		2.4		0.4		34.7
		2821	3921		4801		4591		3977
	34 39.93	34 24.03	5121	34 37.73		34 46.97		34 40.77	
	35 53.53	35 25.645	34 52.209	35 15.97	34 43.645	35 11.80	34 41.736	35 17.70	34 36.155
	+18.87	35 44.375	+57.90	35 49.408	+1 6.21	35 49.368	+1 8.07	35 49.354	+1 13.73	35 49.328
	−.07	− 18.73	−.47	− 57.40	−.44	− 65.72	−.48	− 67.62	−.41	43.17
	− 11	− 18.81		− 57.48		− 65.80		− 67.70		− 43.25
	−.11		−5.15		5.11		−5.10		−5.07	
	+18.09		+52.28	+1 0.66		+1 2.49		+1 8.25	
	+35 44.38		+44.29		+44.30		+44.23		+44.41	
	+45.71	−.07		−.47		−.44		−.48		−.41	
	1.66601									
	1.60451									
		−27.89	+27.98		+5.91	−32.33	−5.23	−30.06	−4.62	−41.55
ε	η	1.44545n	1.44685		0.77159	1.50960n	0.71850n	1.47799n	0.66464n	1.61857n
γ	κ	1.38995n	1.38876		0.71350	1.45151n	0.66041n	1.44990n	0.60655n	1.56048n
		40 1	40 2	40 3	40 4	40 4	40 4	40 4	40 4	40 4
		46.1 53.0	51.6 57.6	18.8 54.6	38.8 44.0	8.5 14.2	40.6 46.9	16.6 22.7	37.6 43.4	16.7 23.4	47.4 53.3
		53.7 49.7	38.2 33.8	47.9 25.8	36.8 18.4	6.9 47.2	39.1 21.7	16.5 54.7	37.4 17.4	14.9 55.2	45.5 28.3
		99.8 102.5	109.8 111.4	167 80.4	756 624	154 121.4	797 686	331 137.4	54.8 40 60.8	326 138.6	929 816
		49.90 51.35	54.90 55.70	48.35 40.20	37.80 31.20	7.70 60.70	39.86 34.30	16.55 68.70	37.48 05 30.40	16.30 69.30	46.45 40.80
		41 50.62	42 55.30	43 44.28	44 31.50	44 34.20	44 37.08	44 42.62	44 33.90 72	44 42.80 1	44 43.62 6
		+ 40.23	− 24.54	+ 24.48		+ 5.17	− 28.28	− 4.58	− 26.30	− 4.04	− 36.35
		42 30.85	30.76	44 8.76		44 9.37	8.80	44 8.04	7.42	44 8.76	7.27
+											
48	40 17.50		17.59	38 39.59		38 38.98	39.55	38 40.31	40.93	38 39.59	41.08
−620	15	19 11	20 09		19 49	19 16	19 40	19 19	19 40	19 09
		0.80585	0.80470	0.80570		0.80540	0.80485	0.80525	0.80485	0.80525	0.80460
		+2232	+2232	+3536		+3574	+3574	+4046	+4066	+2983	+2983
		0.82817	0.82702	0.84106		0.84114	0.84059	0.84571	0.84551	0.83508	0.83443
		+6.7 32	+6.7 13	+6.9 32		+6.94	+6.93	+7.01	+7.01	+6.84	+6.83
		− .56	− .21	− .21		− .02	− .28	− .02	− .24	− .01	− .47
		− .16	− .26	− 1.15		− 1.31	− 1.47	− 1.34	− 1.47	− 1.34	− 1.50
		+ .07	+ .12	+ .15		+ .16	+ .19	+ .17	+ .18	+ .17	+ .19
		+ 6.08	+ 6.36	+ 5.72		+ 5.77	+ 5.37	+ 5.82	+ 5.48	+ 5.66	+ 5.05
+48	40 23.58		23.95	38 45.31		38 44.75	44.92	38 46.13	46.41	38 45.25	46.13
+	40 23.77	+ 2 4.15			+ 3 56.85	38 44.83	+ 3 56.58	38 46.27	+ 3 56.27	38 45.69	+ 3 56.81
	42 26.4	+ 0.1	42 41.7		+ 0.2	42 42.2	+ 0.2	42 42.3	+ 0.2	42 42.6	+ 0.2
	+ 2 3.1	−+18.6	+ 3 56.4		−+33.4	+ 3 57.4	−+33.98	+ 3 56.0	−+34.0	+ 3 56.9	−+34.3
	3.5	+ 1 45.65	56.8		+ 3 23.65	57.8	+ 3 22.88	56.4	+ 3 22.47	57.3	+ 3 22.71
48		+42 9.42		+42 8.96		+42 7.71		+42 8.74		+42 8.40	

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η Persei

2 41 35

+55° 22' 30"

−12° 59' 42"

α_0 41 39.781 s

Corr + 22.2 s

$\frac{d\alpha}{dt}$ + 4.3299

δ_0 22 45.26 "

Corr − 6 "

$\frac{d\delta}{dt}$ + 15.267

1876

+ Jan. 12 +.04

+ Dec. 23 −.39

× Dec. 24 −.42

× Dec. 27 −.36

Jan	1	m 41	40.33		23	43		Dec	6	41	45.47		28	17.0					
	6		40.21	12		11.8	5		11		45.44	3		14.9	9				
	11		40.10	11		5.2	4		16		45.40	4		18.8	9				
	16		39.99	11		5.5	3		21		45.34	6		19.6	8				
	21		39.89	10		5.8	3		26		45.27	7		20.4	8				

log cos δ 9.75441

1.5 cos δ a.n. 9.87936 Jan.
9.87677 Dec.

tang δ + 1.45 + 1.76

sin z − .23

40	47.6	41	2.7	39	59.1	40	17.8	40	0.9	40	16.0	39	30.3	40	10.4				
	50.6		6.4		2.6		21.5		3.0		18.5		32.5		13.8				
	53.8		10.3		5.3		25.7		7.0		23.1		37.8		17.7				
			17.4				32.4				30.4				24.8				
			21.1				85.8				34.1				28.4				
41	49.6		24.6	41	8.1		39.6	41	2.6		37.8	41	1.9		32.9				
	53.0		28.3		11.1		43.2		5.5		41.3		5.4		35.6				
	56.6		32.0		13.5		46.8		8.6		45.2		8.8		39.2				
			39.3				54.1				52.3				46.6				
			43.0				57.7				55.8				50.1				
			46.5				1.4				59.5				53.8				
			27 16				37 54				41 50				35 24				
40	50.67			40	2.33		43 54	40	3.63			39	53.53						
41	53.07	41	24.69	41	10.90	40	39.82	41	5.57	40	37.27	41	5.07	40	32.36				
	+15.36	41	40.72	+1	6.21	41	45.08	+1	8.08	41	45.34	+1	13.74	41	45.50				
	+.06		15.38		−.56		65.73		−.61		67.57		−.52		73.21				
			15.40				65.75				67.59				73.23				
	−.29				−5.53				−5.51				−5.47						
	+15.13			+	0.12			+1	1.96			+1	7.75						
	+41 39.82				+39.70				+39.69				+39.79						
	+34.02		+.06				−.56				−.61				−.52				
	1.53173																		
	1.41109																		
			−28.38		+37.25		−31.32		+34.10		−27.84		+38.51		−33.03				
ε	f		1.45301n		1.57102		1.49582n		1.53275		1.44467n		1.58557		1.51891n				
G	K		1.33237n		1.44790		1.37259n		1.40952		1.32144n		1.46234		1.39568n				
0	1	0	2	6	3	0	4	0	3	0	4	6	3	0	4				
31.7	34.2	19.3	21.1	140	20.7	56	13.0	167	22.5	36	9.2	145	18.9	57	4.4				
36.9	34.4	23.3	21.2	133	52.4	43	45.2	161	53.8	27	42.5	109	51.4	46	46.9				
68.6	68.6	42.6	42.3	273	1331	99	1872	328	1363	63	1117	224	1303	103	1113				
34.30	34.30	21.30	21.15	136.5	66.55	49.5	56.60	1640	68.15	3.15	55.85	11.20	65.15	5.15	55.65				
					1		2		1		5				0 4				
1	34.30	2	21.22	3	40.10	34	31.78	3	42.28	3	29.50	3	38.18	4	30.80				
+	25.77	−	21.50	+	28.05	−	23.58	+	25.68	−	20.96	+	29.00	−	24.87				
2	0.07		59.72	3	38.15		37.70	3	37.96		38.54	3	37.18		35.53				
	48.28																		
+55 20	47.68		48.63	19	10.20		10.65	19	10.39		9.81	19	11.17		12.82				
			−12																
−12	0 32		59 45	0	43	59	52	0	41	59	53	0	45	59	53				
	1.12395		1.12350	1.12405		1.12365		1.12405		1.12365		1.12405		1.12365					
	+2764		+2764	+3488		+3488		+4070		+4070		+2995		+2995					
	1.15159		1.15114	1.16003		1.15963		1.16475		1.16435		1.15400		1.15360					
	+14.18		+14.16	+14.45		+14.44		+14.61		+14.60		+14.26		+14.24					
	− .30		− .20	− .35		− .25		− .30		− .20		− .21		− .28					
	− .11		− .16	− 1.02		− .13		− 1.02		− .13		− .99		− 1.13					
	+ .06		+ .09	+ .13		+ .16		+ .13		+ .16		+ .12		+ .16					
	+ 13.83		+ 13.89	+ 13.21		+ 14.22		+ 13.42		+ 13.28		+ 13.01		+ 12.84					
+55 21	2.11		2.52	19	23.41		24.87	19	23.81		23.09	19	24.18		25.66				
21	2.32	+ 2	3.98	19	24.14	+ 3	56.58	19	23.45	+ 3	56.27	19	24.92	+ 3	56.81				
23	5.3		+ 0.3	22	20.0		+ 0.4	22	20.1		+ 0.4	22	20.6		+ 0.4				
+2	3.0		−+20.0	+3	55.9		−+34.7	+3	56.6		−+34.8	+3	55.7		−+35.3				
	2.4		+1 44.28		55.3		+ 3 22.28		56.0		+ 3 21.87		55.1		+ 3 21.91				
55			+22 46.60				+22 46.47				+22 45.32				+22 46.83				

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T Persei

α_0 2h 45m 24s

δ_0 +52° 14′ 56″

δ_0 − 9° 52′ 08″

	m	s
α_0	45	28.52
const	+	.11
$d\alpha/dt$	+	4.2110
δ_0	15	11.23
const	+	.7
$d\delta/dt$	+	15.029

log cos δ 9.78691
15 cos δ tan i 9.90927
tan δ + 1.29 + 1.63
sin z − .17

I 337

1876

Dec. 12	Dec. 19	Dec. 23	Dec. 24	Dec. 27
− .60	− .41	− .39	− .42	− .36
2 44 47.2	44 26.7	44 24.7	44 16.3	44 19.7	43 58.4	44 21.5	43 48.3	44 6.0	43 35.3	44 0.3
49.1	29.0	26.8	19.7	2.2	23.1	50.6	9.4	37.4	8.7
52.3	33.5	30.0	23.2	5.0	24.9	54.1	12.9	40.9	7.1
	40.0		25.8		26.6		19.6		12.8
	43.5		33.1		28.2		22.9		17.2
	46.7	45 6.2	36.5	44 15.8	29.9	44 37.3	26.3	44 51.8	20.6
	50.2	8.9	39.9	15.2	31.6	34.8	29.8	54.4	24.0
	53.6	12.5	43.4	18.3	33.3	37.8	33.1	57.5	27.3
	0.1		50.0		34.9		37.2		34.0
	3.4		53.5				43.3		37.5
	7.0		56.8				46.7		40.9
	3346		4022		2540		2899		2264
44 49.53	51.46	44 27.17		44 1.87	44 28.23	51.00	5	43 37.87	
	44 46.782	45 9.20	44 36.56	44 5.43	44 28.22	44 54.63	44 26.54	44 54.57	44 20.582
+47.96	45 33942	+57.93	45 33894	+1 6.22	45 33853	+1 8.08	45 33841	+1 13.74	45 33802
−.77	− 4416	−.53	− 5733	−.50	− 6563	−.54	− 6749	−.46	− 7322
	− 47.27		− 57.44		− 65.74		− 67.60		− 73.33
− 5.49		− 5.44		− 5.40		− 5.39		− 5.35	
+41.69		+51.96		+1 0.32		+1 2.15		+1 7.93	
+45 28.47		+45 28.52		+ 28.54		+ 28.51		+ 28.51	
	−.77		−.53		−.50		−.54		−.46
	− 2.75	+ 9.39	− 32.64	+ 26.35	− 27.21	+ 35.35	− 28.28	+ 42.71	− 33.99
ε	0.43933n	0.97267	1.51375n	1.42078	1.43473n	1.54839	1.45148n	1.63053	1.53135n
ζ	0.34860n	0.88194	1.42302n	1.33005	1.34400n	1.45766	1.36075n	1.53980	1.44062n
	10 1	10 1	10 1	10 0	10 1	10 0	10 1	10 0	10 1
	170 224	69 129	405 462	507 524	354 413	436 507	352 415	368 450	396 458
	203 283	63 415	392 216	505 235	344 169	437 216	344 1846	382 169	391 220
	370 1412	132 584	797 678	12 819	98 582	868 723	696 5861	750 619	787 678
	1850 1060	6.60 3920	3985 3390	5060 4095	3490 2910	2340 3615	3480 3305 2605	3750 3095	3935 3390
		33							
	11 14.55	11 17.90	11 36.88	10 45.78	11 32.00	10 39.78	11 31.42 33.92	10 34.22	11 36.62
	− 2.23	+ 7.62	− 26.49	+ 21.38	− 22.08	+ 28.49	− 22.95	+ 34.66	− 27.58
	11 12.32	11 25.52 10.52	10.39	11 7.16	9.92	11 6.47	10.97 8.47	11 8.88	9.04
+ 52	11 36.03	11 37.83 37.83	37.96	11 41.19	38.43	11 39.88	37.39 39.86	11 39.47	39.31
− 9	52 39	52 50	52 16	53 07	52 21	53 13	52 19	53 19	52 16
	1.00105	1.00125	1.00090	1.00150	1.00090	1.00185	1.00090	1.00165	1.00090
	+ 2223	+ 3577 44	+ 3577	+ 3614	+ 3614	+ 4152	+ 4452	+ 3783	+ 3583
	1.02328	1.03649	1.03634	1.03764	1.03704	+ 4077	+ 4077	+ 3011	+ 3011
	+ 10.55	+ 10.88	+ 10.87	+ 10.91	+ 10.89	1.04232	1.04167	1.03176	1.03101
						+ 11.02	+ 11.01	+ 10.76	+ 10.74
	− .00	− .03	− .27	− .18	− .19	− .33	− .21	− .48	− .31
	− .37	− .31	− .50	− .26	− .48	− .19	− .48	− .19	− .57
	+ .05	+ .04	+ .06	+ .03	+ .06	+ .03	+ .07	+ .82	+ .06
	+ 10.23	+ 10.58	+ 10.46	+ 10.50	+ 10.28	+ 10.53	+ 10.39	+ 10.11	+ 9.98
+ 52	11 46.26	11 48.41	48.12	11 51.69	11 48.71	11 50.41	50 27 47.77	11 49.58	49.29
	+ 3 57.17	11 48.27	+ 3 56.85	11		11 50.34	+ 3 56.27	11 49.44	+ 3 56.81
	15 43.5	+ 0.3	15 44.6	+ 0.3	15 45.2	15 45.4	+ 0.3	15 45.8	+ 0.3
	+ 3 57.2	− + 32.3	+ 3 56.3	− + 33.4	+ 3 56.5	+ 3 55.1	− + 34.2	+ 3 56.4	− + 34.6
	57.9	+ 3 26.17	57.0	+ 3 23.75	57.2	55.8	+ 3 22.37	57.1	+ 3 22.51
52		+ 15 11.48		+ 15 12.02	+ 3 56.58		+ 15 12.74		+ 15 11.95
					+ 0.3		12.71		
					− + 34.0				
					+ 3 22.88				
					+ 15 11.59				

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β Ursae Min. d_0

14 m 51 s

+74° 39' 58"

+105° 20' 02"

−65° 57' 14"

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

d_0 51 5.77 + .10 − 0.2439 39 43.10 20 16.90 + 1.1 − 14.762

1876

Dec. 12 −.60

14	49	35.5	49	57.5	50	10.1	49	47.8	47	42.7	49	38.8	48	1.6	49	38.0	47	27.0	49	32.3
		40.3		1.1		17.3		51.7				43.7		1.08	53.60	42.0		33.9		36.0
		48.0		4.8		25.0		53.7				47.6		1.7.1	.70	46.0		41.9		39.9
				8.2				54.3				51.4			.80	—				48.8
				12.5				8.6				53.2			—					48.0
	50	38.9		16.2				7.3	48	39.1		54.1	48	44.7	—		48	36.8		52.0
		49.0		20.0				11.0		44.7		2.9		50.3	—			46.6		56.2
		59.2		24.1				15.1		52.4		7.0		55.3	—			54.9		59.7
				28.0				19.0				10.9			—					3.7

Dec. 19 +.41

								27.05				30.56							37.16
49	41.27		1.734	50	17.47			30.5	47	42.70		49.56	48	9.83			47	34.27	43.16
50	49.08	50	12.600			50	33.68	48	45.50	49	55.087	48	54.43	49	53.700		48	46.10	49	47.956
							38.9												

Dec. 23 +.39

Dec. 24 ×.42

Dec. 27 ×.36

	+47.96	51	2.337		+57.94	51	2.719	+1	6.22	51	2.955	+1	8.09	51	3.021	+1	13.74	51	3.219
	+2.19		4.974		+1.50		59.33		+1.42		67.89		+1.53		69.32		+1.31		75.26
			49.84				59.43				67.99				69.42				75.36
	+ 2.74				+ 2.36				+ 2.12				+ 2.06				+ 1.856		
	+52.89			+1	1.80			+1	9.76			+1	11.68			+1	16.91		
+51	5.49				+ 5.19				+ 4.83				+ 5.38				+ 4.87		

	+ 31.33		+ 2.19				+ 1.50				+ 1.42				+ 1.53				+ 1.31
	1.49596																		
	1.04064$_n$																		
			− 36.43		− 14.08		− 14.48		+ 132.37		+ 69.57		+ 103.87		+ 62.27		+ 133.69		+ 61.86
	E		1.561462$_n$		1.148602$_n$				2.12176		1.86242		2.016409		1.79428		2.12616		1.79141
	g		1.10614		0.69328				1.66647$_n$		1.38710$_n$		1.56117$_n$		1.33896$_n$		1.67078$_n$		1.33609$_n$

	5	3	5	2	5	3	5	2	5	3	5	3	5	3	5	3	5	3	5	3
	"	"																		
	4.8	19.0	45.1	54.1	34.9	45.1	55.6	3.4	47.7	57.1	24.4	33.2	37.1	48.5	23.1	32.6	46.4	53.9	20.2	28.5
	14.3	50.8	49.4	25.5	34.7	10.5	56.3	34.7	47.4	24.2	25.5	0.4	38.8	15.0	24.4	39.6	46.5	22.5	20.0	56.9
	247	1898	145	796	95	556	119	984	151	813	99	336	159	635	75	1520	129	864	02	1464
	12.35	49.04	7.25	39.80	4.75	27.8	5.95	49.20	7.55	40.65	2.495	16.80	3.795	31.75	2.375	76.0	4.645	43.20	2.010	13.20
						31.28										19.88				
	8	8.62	7	43.52	8	3.76	7	52.58	8	44.10	8	20.88	8	34.85	8	44.078	8	4.82	8	16.65
	− 10.98		+ 12.77		+ 4.98		+ 4.93		− 46.39		− 24.38		− 36.40		− 21.83		− 46.86		− 21.68	
	7	57.64		56.29			7	57.51	7	57.71	7	56.50	7	58.45	7	58.04	7	55.48	7	54.97
+108																				
74	14	50.71		52.06			14	50.84	14	50.64		51.85	14	49.90		50.31	14	52.89		53.38
.6245							2.04997		2.04969		2.04981		2.04975		2.04985		2.04969		2.04985	
−82																				
	55	44	56	09			56	00	55	09	55	32	55	18	55	33	55	41	55	34
	2.107788		2.107788				2.107788		2.107757		2.107757		2.107757		2.107757		2.107757		2.107757	
	1.221550		1.221550				1.221550		1.221545		1.221565		1.221538		1.221575		1.221550		1.221550	
	2.329338		2.329337				2.329338		2.329302		2.329322		2.329295		2.329332		2.329307		2.329307	
	2.147399		2.147399				2.147399		2.147399		2.147399		2.147399		2.147399		2.147399		2.147399	
	2.086748		2.086748				2.086748		2.086711		2.086723		2.086696		2.086734		2.086711		2.086711	
	+ 61.12		+ 61.12				+ 61.12		+ 61.11		+ 61.11		+ 61.11		+ 61.11		+ 61.11		+ 61.11	
	+ 121.92		+ 121.92				+ 121.92		+ 121.92		+ 121.92		+ 121.92		+ 121.92		+ 121.92		+ 121.92	
	+ .14		+ .19				+ .03		+ 2.94		+ .48		+ 1.80		+ .34		+ 2.49		+ .34	
	− .98		− .84				− .40		− 1.18		− 1.06		− 1.15		− 1.56		− 1.18		− 1.06	
	+ .12		+ .11				+ .12		+ .15		+ .13		+ .14		+ .13		+ .15		+ .13	
	+1 5740		+ 1.5760				1.00		3.34		1.71		3.70		2.84		1.68		+1 5987	
	+2 14.24		+2 14.34				+2 16.34		2 20.72		+2 19.41		+2 21.25		+2 20.40		+2 19.53		+2 17.02	
+105	17	64.95	48.11	6.50	49.66		18	69.21	5184	11.36	17	10.96	17	11.15	5360'	10.15	17	11.12	17	10.40	5325
	17	5.72	+ 3	57.17			17	14.29	16	53.98	16	53.56	17	10.99	+ 3	56.27	16	11.06	+ 3	56.81
	20	30.0		+ 1.7			20	52.3	16	53.77	20	53.86	20	53.88		+ 1.7	20	54.7		+ 1.7
	+3	44.3		− 33.4			+3	43.1	0.5		+3	42.6	+3	42.7		− 36.9	+34	49.6		− 37.8
	+4	40.2	+ 3	25.77			3	9.4	59.4		41.5	58.7	41.8	58.4	+ 3	21.07	3	12.6	+ 3	20.71
																		54.7		
105			+20	31.49			+ 3	56.85			+ 3	56.58			+20	30.00			+20	31.77
				14.65				+ 1.7				+ 1.7				14.45				14.63
								− 32.4				− 36.1								
							+3	23.15			+3	21.58								
							+20	37.43	1487		+20	37.54	1535							

log cos δ 9.42232$_n$

15 corr tang 9.54468$_n$

tang δ − 3.65 − 3.79

sin z − .91 .89

log I 1.89197

I 780

½ I 3.90

log sin δ 9.98426

" cos δ 9.42232$_n$

" const. 6.73672

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Beti'

| | | |

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	m	s		″
July 19	55	49.37		23.7
24		49.53	16	24.6 9
29		49.69	16	25.4 8
Aug. 3		49.85	16	26.2 8
8		50.00	15	27.0 8

+ −.06 Jan. 20 | −.85 July 24 X | −.57 −.10 Aug. 1 X | −.60 Dec. 12 X

| | | |

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B Persei

| | | |

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48 H. Cephei

3h 4m 32s Conv +77° 16' 19"

−34° 53' 31" S_0 Cons $\frac{dS}{dt}$

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

2m 4 39.481

± .10 / 2

+ 7.3617

16 32.38

+ .8

+ 13.822

1876

+.02 −.02 −.60 −.53 −.41 −.36

+ Jan 26 + Jan 27 Dec. 12 × Dec. 13 Dec. 19 × Dec. 27 ×

Jan 21 26 31 — Dec 6 11 16 21 26

log cos δ 9.34268

15 constant 9.46763 Jan. / 9.46504 Dec.

Long δ +4.43 +4.55

sin z −.57

Ch d.

+21.14 +.09 −.04 +21.19 +4 39.46

+.09

+17.37 1.23980 0.70743

+21.53 −.09 +.048 +21.48 +39.40

−.09

+47.97 −2.66 −10.88 +34.43 +39.80

−2.66

−2.35

+57.96 −1.82 −10.66 +45.48 +39.42

−1.82

+1 13.76 −1.59 −10.33 1.84 +39.50

−1.59

| | | |

1876phae.proj:1481:

γ Arietis

N.A.

α 3h 7m 43s

δ +20° 34' 48"

+ 21° 48' 00"

dα/dt

dδ/dt

	m	s	m	s		m	s									
0			7	46.581	Jan 20	7	47.11			35	12.0			log cosδ	9.97135	
					25		47.05	6			11.8	2				
dα/dt			+ 3.438		30		46.98	7			11.7	1		15 cosδ tanι	009630	Jan
															009371	Dec.
δ0	°	'	25	1.81	Dec 14		51.17				27.2					
					19		51.16	1			27.2	0				
dδ/dt			+ 13.64		24		51.15	1			27.2	0		tanδ	+ 0.38	+ 1.07
					29		51.12	3			27.2	0				
					34		51.09	3			27.2	0		sin z	+ .37	

1876

+.02 −.60 −.41 −.39 −.36

Jan. 26				Dec. 12				Dec. 19				Dec. 23				Dec. 27			
m	s	m	s																
6	55.3	7	12.6	6	45.4	6	30.2	6	35.6	6	40.2	6	15.7	6	31.9	6	21.9	6	24.3
	57.2		14.7		47.5		32.2		37.2		42.3		17.4		34.0		23.2		26.4
	58.8		17.0		49.7		34.5		39.1		44.6		19.0		36.2		24.7		28.7
			21.4				59.0				49.0				40.6				33.0
			23.6				1.3				51.2				42.8				35.3
7	45.3		25.9	7	27.5		3.3	7	32.5		53.3	7	14.1		45.0				37.6
	47.0		28.0		30.3		5.5		34.3		53.6		16.2		47.3				39.7
	49.0		30.2		32.2		7.8		35.9		57.8		18.6		49.4				41.8
			34.7				12.2				9.2				53.9				46.3
			36.9				14.7				4.4				56.0				48.5
			39.1				16.7				6.5				58.2				50.6
			28.41				27.74				40.71				49.53				41.22
6	57.10			6	47.53		34.4	6	37.30		58.71	6	17.37			6	23.27		43.73
7	47.10	7	25.827	7	30.00	7	3.400	7	34.23	6	53.373	7	16.30	6	45.027			6	37.473
7	47.04		+21.14	7	51.17		+47.97	7	51.16		+57.96	7	51.15	+1	6.24	7	51.13	+1	13.77
			+.01				−.23				−.16				−.15				−.14
			− 0.46				− 4.59				− 4.58				− 4.57				− 4.55
			+ 20.69				+ 43.15				+ 53.22			+1	1.52			+1	9.08
			7 46.52				46.55				46.59				46.55				46.55

3h 7m 46.552

+28.73
1.45834
1.55464

		−21.27		+15.87		−26.60		+16.07		−40.86		+27.66		−31.27		+14.20			
E	F	1.32777n		1.20058		1.42488n		1.20662		1.61130n		1.44185		1.49513n		1.15229			
G	H	1.42467n		1.29429		1.51859n		1.29973		1.70501n		1.53556		1.58884n		1.24600			
′	″																		
45	3	45	4	50	0	50	1	50	0	50	1	50	0	50	1	50	0		
393	387	438	435	388	421	321	329	380	433	467	571	249	259	370	403	394	452		
406	411	452	451	371	228	305	142	356	189	443	303	216	43	336	191	369	218		
799	798	890	886	759	649	626	481	736	622	830	814	465	332	706	594	763	670		
3995	3990	4450	4430	3795	3245	3130	2405	3680	3110	4657	4070	2325	1660	3530	2970	3815	3350		
′	″																		
48	39.93	49	44.40	50	35.20	51	27.68	50	33.95	51	43.60	50	19.92	51	32.50	50	35.82		
+	35.86	−	26.55	+	19.69	−	33.00	+	19.94	−	52.70	+	34.32	−	38.80	+	17.62		
49	15.79		17.85	50	54.89		54.68	50	53.89		52.90	50	54.24		53.70	50	53.44		
+20	33 32.56		30.50	31	53.46		53.67	31	54.46		55.45	31	54.11		54.65	31	54.91		
+21	46 34	47	38	46	42	47	35	46	41	47	51	46	27	47	40	46	43		
	1.36170	1.36216		1.36180		1.36215		1.36180		1.36225		1.36170		1.36215		1.36180			
	+.03591	+.03591		+.02272		+.02272		+.03562		+.03562		+.03710		+.03710		+.03071			
	1.39761	1.39806		1.38452		1.38487		1.39742		1.39787		1.39880		1.39925		1.39251			
	−24.98	−25.01		−24.24		−24.26		−24.97		−25.00		−25.05		−25.08		−24.69			
	− .15	− .08		− .04		− .13		− .04		− .29		− .14		− .18		− .03			
	− .37	− .47		− .19		− .46		− .19		− .53		− .42		− .48		− .19			
	+ .15	+ .14		+ .02		+ .01		+ .02		+ .07		+ .01		+ .06		+ .02			
	−25.35	−25.37		−24.45		−24.84		−25.18		−25.75		−25.28		−25.68		−24.89			
+20	33 7.21		5.13	31	27.01		28.83	31	29.28		29.70	31	28.83		28.97	31	30.02		
	33 6.17	+2	4.74	31	24.92	+3	57.17	31	29.49	+3	56.85	31	28.90	+3	56.58			+3	56.81
	35 11.8		−0.8	35	27.2		−0.8	35	27.2		−0.8	35	27.2		−0.8	35	27.2		−.08
			−.10				− 25.4				− 25.4				− 25.4				− 25.3
		+1	53.94			+3	30.97			+3	30.65			+3	30.38			+3	30.71
		20	35 0.11				34 59.89				35 0.14				34 59.28				35 0.73

+20° 35′ 0.30″
.03

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ζ Persei

α 3 15 24
δ +49° 24′ 51″
μ −7 2 3

	α_0	δ_0	$\frac{d\alpha}{dt}$	$\frac{d\delta}{dt}$
	m s 15 28.699	″ 25 38.2	s +4.2514	″ +13.127
Cond	− .02	+ .8		
1876 +	−.04	+.06 +.10		
	Jan 10	Jan 11		

log cos δ 9.81328
15 Const. Jan. 9.93823
15 Const. Dec. 9.93564
tang δ +1.17 +1.54
sin z −.12

	Jan	α	δ		Dec	α	δ	
	1	29.54	25.2		6	34.39	31.8	
	6	29.46	21.7	5	11	34.37	32.7	9
	11	29.38	22.1	4	16	34.35	33.5	8
	16	29.30	22.5	4	21	34.34	34.3	8
	21	29.22	22.9	4	26	34.33	35.0	7
	26	29.12	23.1	2				
	31	29.12	23.2	1				
						+.02		
	Jan 16				Jan 27			
				−.02				+.01
					Jan 31			
								−.60
								Dec. 12

	14	35.5	14	33.3	14	45.1	14	55.2	14	33.7	14	48.8	14	40.5	14	48.6	14	33.9	14	46.4	14	15.3	14	27.8
		38.3		88.6		48.3		58.3		35.9		52.0		43.0		51.6		37.9		49.9		17.7		31.2
		40.9		1.7		51.0		1.4		37.5		53.3		46.3		54.8		40.2		52.8		20.3		34.3
				8.0				7.8				1.6				1.1				3.3				40.6
				11.3				11.0				4.7				4.4				2.3				48.8
	15	54.2	15	41.5	15	44.3	15	54.1	15	30.3	15	47.8	15	30.8	15	47.5	15	34.1	15	46.0	15	11.1	15	47.0
		36.6		44.1		48.1		57.3		32.5		51.0		34.0		50.6		36.7		49.0		13.9		50.3
		39.8		47.6		57.0		60.4		35.0		54.2		37.7		53.8		39.4		52.4		18.0		53.4
				20.8				20.4				20.6				20.1				18.5				58.7
				27.0				26.7																
				30.4				30.0				23.6				23.4				21.6				2.8
				33.6				33.2				26.9				26.5				25.0				6.0
				27.87				27.54				26.65				26.24				30.32				39.70
	14	38.23	15	15.87	14	48.20		15.54	14	35.70		86.85	14	43.27		82.4	14	37.33		63.2	14	17.77		51.70
	15	56.87	14	14.27	15	44.63	14 15	14.27	15	32.60	15	7.86	64 15	34.17	15	74.91	15	36.80	15	57.45	15	14.33	14	47.000
		+14.98	15	29.392		+15.06	15	29.376		+21.14	15	29.115		+21.54	15	29.095		+23.17	15	29.015		+47.98	15	34.365
		−.05		− 14.96		+.07		− 15.25		+.02		− 21.25		−.02		− 21.60		+.01		− 23.27		−.70		− 47.36
				− 14.94		+.125		− 15.23				− 21.23				− 21.58				− 23.25				− 49.34
		−.69				−.67				−.42				−.40				−.31				−5.67		
		+14.24				+14.61				+20.74				+21.12				+22.87				+~~20.67~~ 41.61		
	+15	28.67				+28.74				+28.60				+28.61				+28.61				+~~28.61~~ 28.61		
		+36.20		−.05				+.07				+.02				−.02				+.01				−.70
		1.55871						+.12																
		1.49694																						
	E	F		−42.44		+35.93		−30.60		+32.16		−24.74		+24.22		−26.68		+28.41		−31.06		+29.23		−27.33
				1.62778n		1.41380		1.48430n		1.50732		1.39340n		1.38417		1.42619n		1.45347		1.49220n		1.46583		1.43664n
	G	K		1.56601n		1.35203		1.42253n		1.44555		1.33163n		1.32240		1.36442n		1.39170		1.43043n		1.40147		1.37228n
				55 4		0 0		55 4		0 0		55 4		55 4		55 4		55 4		55 4		0 0		0 1
		2.0		7.3		9.9	14.8	9.9	14.4	0.0	4.3	5.6	7.4	5.7	5.8	12.0	14.8	5.6	5.9	5.5	8.7	5.7	5.9	5.6.2	2.0	4.6.6	5.7.1
		7.1		5.4.5		15.1	6.2	16.5	10.5	3.2	3.8	9.7	4.4	1.8	5.6.3	19.5	13.8	2.0	5.7.3	13.2	7.3	2.4	5.9.2	5.8.9	3.7.0	4.7.6	2.8.6
		9.1		12.18		25.0	21.1	26.4	24.9	3.2	8.1	15.3	11.8	11.95	11.6.1	31.5	28.6	11.81	11.6.4	28.7	16.0	11.9.1	11.8.7	151	99.0	142	70.7
		45.3		60.90		12.50	10.53	13.20	12.45	1.60	4.05	7.65	5.90	5.7.15	5.8.05	15.75	14.30	5.7.05	5.8.20	14.35	8.00	5.7.85	5.7.35	5.7.55	49.50	4.7.10	39.85
		59	27.2	0	11.32	59	12.82	0	2.82	54	6.77	59	58.90	59	15.02	59	58.62	59	8.68 14.17	59	8.60	0	53.52	1	43.48
			+ 31.40		− 36.82		+ 22.49		− 26.46		+ 27.90		− 21.46		+ 21.01		− 23.14		+ 24.64		− 26.94		+ 25.20		− 23.66
		59	34.12		34.70	59	35.31		36.36	59	34.67		37.44	59	36.03		35.48	59	33.32		32.66	1	18.72		19.92
+49		23	14.23		13.65	23	13.04		11.99	23	13.68		10.91	23	12.32		12.87	23	16.03		15.69	21	29.63		28.43
−7		3	3	1	54	2	53	2	3	2	59	2	57	2	51	2	07	2	57	2	06	3	00	2	10
		0.85245		0.85150		0.85250		0.85165		0.85260		0.85170		0.85245		0.85170		0.85250		0.85170		0.85260		0.85180	
		+2049		+2049		+3246		+3266		+3605		+3605		+1287		+1287		+3105		+3105		+2293		+2293	
		0.87314		0.87199		0.88516		0.88431		0.88865		0.88775		0.86532		0.86457		0.88355		0.88275		0.87553		0.87473	
			+ 7.47		+ 7.45		+ 7.68		+ 7.66		+ 7.74		+ 7.72		+ 7.83		+ 7.82		+ 7.65		+ 7.63		+ 7.51		+ 7.49
		−	.35	−	.48	−	.18	−	.26	−	.27	−	.16	−	.15	−	.19	−	.22	−	.26	−	.23	−	.20
		−	.03 .28	−	.01	−	.29	−	.00	−	.11	−	.50	−	.42	−	.50	−	.45	−	.55	−	.28	−	.53
		+	.16	+	.01	+	.17	+	.00	+	.16	+	.20	+	.17	+	.20	+	.16	+	.20	+	.04	+	.07
		+	7.52	+	6.97	+	7.38	+	7.41	+	7.22	+	7.26	+	6.93	+	6.83	+	7.14	+	7.02	+	7.04	+	6.83
+49		23	21.23		20.62	23	20.42		19.40	23	20.90		18.17	23	19.25		19.70	23	22.14		22.71	21	36.64		35.26
		23	20.92	+ 2	2.97	23	19.91	+ 2	4.04	23	19.54	+ 2	4.74	23	19.48	+ 2	4.76	23	22.44	+ 2	4.19	21	35.9	86 + 3	57.1
		25	22.6		+0.0	25	22.1		+0.1	25	23.1		+0.2	25	23.1		+0.2	25	23.2		+0.2	25	32.9		+0.2
		+ 2	1.1		−+18.2	+ 2	2.2		−+18.3	+ 2	3.6		−+19.3	+ 2	3.6		−+19.3	+ 2	0.8		−+19.4	+ 3	56.9		−+29.1
			1.9	+ 1	44.17		3.0	+ 1	45.84		4.4	+ 1	45.64		4.4	+ 1	45.66		1.6	+ 1	44.99		57.7	+ 3	28.27
49					+25 5.09				+25 5.75				+25 5.18				+25 5.14				+25 7.43				+25 4.23

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γ Ursae Min.

15h 20m 57s
+72° 16' 44"
−29° 53' 36"
+107° 43' 16"
−65° 20' 28"

1876 Jan. 10 × Jan. 11 + Jan. 26 + Jan. 27 Dec. 12 × 1877 Jan. 2

log cos δ
15 constants
tang δ
sin z

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f Tauri

3 23 58

+12° 30' 24"

+29 52 24

| | | |

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ε Eridani

α 3 27 2
δ −9° 52' 38"

1876 Jan 10 × Jan 26 × Jan 27 × Jan 31 × Dec. 12 × Jan. 2 ×

	1876 Jan 10	Jan 26	Jan 27	Jan 31	Dec 12	1877 Jan 2
α	3h 27m 2s					
δ	−9° 52' 38"					
t	1h 5m 46s					
	−.04	+.02		−.02	+.01	−.60 −.40
	26 33.60	26 22.10	26 55.50	26 20.37	26 30.13	25 31.27
	27 34.17	27 18.27	26 44.882	27 19.80	26 42.845	27 3.50 26 21.409 26 10.17 25 46.336
	+14.99	+21.145	+21.55	+23.17	+47.99	+1 23.07
	+.01	−.00	+.00	−.00	+.10	+.07
	27 6.196	27 6.027	27 6.015	27 5.966	27 9.470	27 9.411
	− 14.97	− 21.14	− 21.45	− 23.12	− 48.06	− 83.08
	− 15.00	− 21.17	− 21.48	− 23.15	− 48.09	− 83.11
	−.89	−.72	−.70	−.66	−4.16	−4.10
	+14.11	+20.43	+20.85	+22.51	+43.93	+1 19.04
	+27 5.34	+27 5.31	+5.41	+5.35	+5.34	+5.38
	+17.63	+.01	−.00	+.00	−.00	+.10 +.07
	1.24625					
	1.36471					
	−43.54	+22.78	−33.39	−10.94	−37.14	+22.47 −36.96 − 8.72 −42.09 +15.07 −23.83
E	1.63889	1.35755	1.52362	1.03902	1.56984	1.35160 1.56773 0.94052 1.62148 1.17811 1.37712
G	1.75735	1.47601	1.64208	1.15748	1.68830	1.47006 1.68619 1.05639 1.74005 1.29398 1.49299
	15 0	15 2	15 0	15 2	15 1	15 2 15 0 15 2 15 3 15 3 15 2 15 3
	538 512	148 113	457 411	03 564	337 300	83 47 461 419 39 01 81 54 540 477 406 401 303 280
	524 —	123 119	470 459	589 611	388 365	81 130 490 501 43 74 35 496 477 349 348 183 230 83
	62	11 12	127 70	1192 1175	95 65	4 177 151 920 82 75 116 1150 1017 846 754 584 533 363
	53.10	13.55 11.60	46.35 43.50	59.60 58.75	34.75 33.25	8.20 8.85 47.33 46.60 4.10 3.75 5.80 57.50 50.85 42.30 37.70 29.20 26.65 18.15
		17 12.57	15 44.92	17 59.17	16 34.00	17 8.52 15 46.77 17 3.92 18 3.65 18 46.58 17 33.45 18 22.40
	+ 23.16	− 57.19	+ 29.92	− 43.86	− 14.37	− 48.74 + 29.52 − 48.55 − 11.39 — 54.96 + 19.68 − 31.12
		16 15.38	16 14.84	15.33	16 19.83	19.73 16 16.29 15.37 17 50.26 51.62 17 53.13 51.28
	−9	53 27.03	53 26.49	26.96	53 31.28	31.38 53 27.94 27.02 55 1.91 3.27 55 4.78 2.93
	+52	15 07	13 39	15 53	14 28	15 3 13 41 14 58 14 09 14 54 13 46 14 29
		1.87060	1.87020	1.87080	1.87045	1.87060 1.87025 1.87060 1.87035 1.87053 1.87025 1.87045
		+2096	+3624	+3624	+1300	+1300 431 +3121 +2321 +2321 +3044 +3044
		1.89156	1.90644	1.90704	1.88345	1.88360 1.90140 1.90175 1.89356 1.89376 1.90069 1.90089
		−77.80	−80.62	−80.73	−76.46	−76.49 −79.69 −79.75 −78.26 −78.30 −79.56 −79.60
		+ .17	+ .05	+ .10	+ .01	+ .13 + .04 + .13 + .01 + .17 + .02 + .06
		− .15	− 07	− .30	− .16	− .21 − .09 − 2.82 − .93 − 1.82 − .75 − 1.02
		+ .04	+ .03	+ .12	+ .06	+ .08 + .03 + .09 + .12 + .15 + .10 + .14
		−1 1779	− 80.61	− 80.81	− 76.55	− 76.49 − 79.71 − 79.75 − 79.06 − 79.16 − 80.19 − 80.43
	−9	54 44.82	54 47.10	47.77	54 47.83	47.87 54 47.65 46.77 56 20.97 22.43 56 24.97 23.86
		54 47.44	54 46.0	+2 4.74	54 47.85	+2 4.76 54 47.21 +2 4.19 56 21.40 +3 57.17 56 24.16 +3 56.74
		52' 46.6	52 46.0	−1.8	52 46.1	−1.8 52 46.3 −1.8 52 27.2 −1.7 52 22.6 304 −2.1
		+2 0.2	+2 1.4	−+0.1	+2 1.8	+0.0 +2 0.9 +0.3 +3 54.5 19.9 +3 53.8 −15.7
		0.2	1.4	+2 2.84	1.8	+2 2.96 0.9 +2 2.69 54.5 +3 14.37 53.8 +3 38.14
		+2 2.37				3 36.57 3 36.94
	−9	− 45		−52 44.60		−52 44.89 −52 44.62 −52 45.13 −52 45.22
		− +1.5				4452
		+1 59.37				
		−52 45.45				

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Gr. 716

3 m 31 s 19

+62° 48' 32"

−20° 25' 44"

1876

+ Jan. 10

+ Jan. 26

+ Jan. 31

Dec. 12 ×

Jan. 2 ×

Jan. 4

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δ Persei

3 34 2
+47° 23' 8"
− 5 0 20

1876 x Jan. 10 | + Jan. 26 | + Jan. 31 | Dec. 12 × | Jan. 2 × | Jan. 4

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1876phae.proj.1461.

δ Eridani

$3^h\ 37^m\ 16^s$

[$-9°\ 48'\ 24''$] $-10°\ 11'\ 18''$?

[$+52°\ 11'\ 12''$] $+52°\ 34'\ 06''$

log cos δ 9.99362

15 cos δ cos τ 0.11857 Jan 1876
0.11598 Dec 1876 + Jan 1877

tan δ −0.17

sin z +.79

1876 +.02 +.01 −.60 1877 −.40 −.25

Jan. 26		Jan. 31		Dec. 12		Jan. 2		Jan. 4	
36 43.0	36 45.4	36 22.4	36 43.5	36 35.9	36 22.0	36 7.3	35 —	35 47.7	35 44.0
47.1	47.7	34.1	45.3	38.2	24.2	9.5	—	49.5	46.2
49.2	49.9	36.4	47.6	40.8	26.1	11.8	—	51.1	48.2
	54.1		51.7		80.4	5958	53.4		52.4
	56.2		53.0		32.6	.59	57.5		54.6
37 86.6	58.3	37 20.7	86.0	37 12.6	84.7	.60	57.6	36 36.4	56.4
89.0	0.3	22.5	58.2	14.4	86.7	.61	1.7	38.0	58.8
40.8	2.4	24.8	0.2	15.9	88.9	.72	3.9	40.2	0.8
	6.6		4.5		43.1	.64	8.0		5.0
	8.7		6.4		45.1	.75	10.2		7.2
	10.9		8.6		47.3	.76	12.3		9.3
	3407		3764		3811				3832
36 47.10	6407	36 34.30	61.64	36 38.30		36 9.53		35 49.43	62.32
37 38.80	36 58.245	37 22.67	36 56.036	37 14.30	36 34.645		35 59.656	36 38.20	35 56.655
+21.15		+28.17		+45.00		+1 23.09		+1 26.11	
−.00		−.00		+.10		407		+.04	
− 0.77		− 0.70		− 4.24		− 1.31		− 1.30	
+ 2038		+ 2247		+ 43.86		+1 21.85		+1 2485	
37 1862		1851		18.50		21.51		21.80	

h m s
3 37 18.543 '76
19.728
21.505 77

+11.14
1.04689
1.16546

	− 40.56	+ 21.74	− 26.63	− 3.66	− 39.66	− 9.87		+ 7.22	− 41.55
Ey	1.60810n	1.33726	1.42537n	0.56348n	1.59835n	0.99432n		0.85854	1.61887n
Ey	1.72667n	1.45583	1.54394n	0.67946n	1.71433n	1.11030n		0.97452	1.73455n
	30 4	35 0	30 4	35 0	35 1	35 2	35 1	35 1	35 2
	19.0 15.1	26.3 22.4	4.5 1.4	8.1 5.5	21.4 18.8	7.1 4.0	31.5 31.1	8.0 7.8	11.1 9.8
	19.4 17.1	26.6 26.2	5.8 9.2	10.0 12.8	15.2 59.2	2.5 47.4	25.8 8.2	3.1 44.0	4.2 44.0
	4. 12.2	9 8.6	10.3 10.6	18.1 18.3	36.6 1280	9.6 11.4	57.3 39.3	11.1 18.8	15.3 18.8
	19.20 16.10	26.45 24.30	5.15 5.30	9.03 9.15	18.30 6400	4.80 55.70	28.65 19.65	5.55 55.90	7.65 59.40
					13.65				
	34 17.65	35 25.37	34 5.22	35 9.10	36 12.35	37 8.025	36 24.15	36 8.072	37 33.52
	+ 14.44	− 53.30	+ 28.56	− 34.99	− 4.78	− 51.80	− 12.89	+ 9.43	− 54.27
	34 32.29	32.07	34 33.78	34.11	36 8.87	8.45	36 11.26	36 10.15	9.25
−10	11 43.94	43.72	11 45.43	45.76	13 20.52	20.10	13 22.91	13 21.80	20.90
+52	32 12	33 19	31 59	33 3	32 21	33 07	32 31	32 08	33 11
	1.87506	1.87535	1.87500	1.87530	1.87510	1.87530	1.87515	1.87505	1.87535
	+3839	+3839	+3123	+3123	+2041	+2841	+3060	+3837	+3837
	1.91145	1.91174	1.90623	1.90653	1.89851	1.89871	1.90575	1.91342	1.91372
	−81.55	−81.61	−80.58	−80.64	−79.76	−79.80	−80.49	−81.93	−81.98
	+ .01	+ .16	+ .04	+ .07	+ .00	+ .15	+ .01	+ .01	+ .17
	− .43	− .04	− .45	− .02	− .37	− .62	− .42	− .30	− .63
	+ .17	+ .02	+ .16	+ .01	+ .05	+ .08	+ .10	+ .04	+ .08
	−1. 2180	−1 21.47	−1 20.92	−1 2056	−1 19.48	−1 19.59	−1 20.80	−1 2218	−1 2236
−10	13 5.74	5.19	13 6.35	6.34	14 40.00	39.69	14 43.71	14 43.98	43.26
	13 5.46	+2 4.74	13 6.34	+2 4.19	14 39.84	+3 57.17	14 43.71	+3 56.74	14 43.62 +3 56.72
		−1.8		−1.8		−1.7		−2.1	−2.1
		−0.2		+0.1		−18.3		−3.6	−3.3
		+2 2.74		+2 2.19		+3 37.57		+3 51.04	+3 51.32
	−10 11 2.72		11 3.85		11 2.67		10 52.67		10 52.30

−10° 11' 3.98 76
−10 10 58.84
10 52.48

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η Tauri

3h 40m 3

+23° 43' 0"

+18° 39' 48"

1876

Jan 10 ×

Jan 11 +

Dec 12 +

1877

Jan 2 +

Jan 4

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27 Cridani

3h 41m 28s

−23° 36' 57"

+65° 59' 45"

log cos δ 9.96201 log I 0.35228

15 Andromedae 0.08696 Jan. 1876 I 2.25
0.08437 Dec. 1876 Jan. 1877

tang δ −0.44 +1.09

sin z +.91

1876 +.01 Jan. 31 | −.60 Dec. 12 | 1877 −.40 Jan. 2 | −.25 Jan. 4

40	37.0		53.0	40	27.0	40	38.3	39	47.0	39	55.0	39	41.4	39	53.2
	53.6		57.2		28.6		35.6		49.6		0.4		44.0	40	3.4
	53.4		57.4		31.2		37.9		52.3		2.6		45.6		5.7
			4.0				42.4				7.0				4.1
			6.2				44.6				9.3				6.5
41	49.0		8.4	41	20.2		46.8	40	43.6		11.7				8.7
	46.8		10.6		22.2		49.0		45.4		14.0				10.9
	48.9		12.9		24.0		51.2		47.9		16.1				
			17.4				53.8				20.6				
			19.6				57.9				22.8				
			21.8				0.1				25.2				
			272.5				454.6				187.7				
			9.25												
40	53.33			40	28.93		51.46	39	49.63		12.77	39	43.67		
41	46.90	41	8.409	41	22.13	40	46.782	40	45.63	40	1.1864			40	8.678

	+23.17			+48.00			+1 23.09				+1 26.12				
	−.00			+.26			+.18				+.11				
	−.081			−4.13			−1.45				−1.43				
	+22.36			+44.13			+1 21.82				+1 24.80				
	41 30.77			30.91			33.43				33.48				

3h 41m 30.840 76
32.448
33.455 77

	+15.08		−.00			+.26				+.18				+.11	
	1.17840														
	1.26536														
			−38.49		+17.85		−35.35		+21.98		−34.02		+25.01		
E	F		1.58535n		1.25164		1.54839n		1.34203		1.53173n		1.39811		
G	H		1.67231n		1.33601		1.63276n		1.42640		1.61610n		1.48248		
'	'														
55	4	0	0	0	0	0	2	0	0	0	2	0	0	0	2
"	"														
185	173	337	217	56.9	53.4	1.8	57.4	55.8	55.1	8.3	36	48.7	37.4	10.3	11.4
21.7	24.1	28.3	31.2	51.9	39.1	58.1	46.9	50.1	35.6	7.5	45.3	45.3	26.3	6.3	5.28
402	414	590	529	88	94.5	59.9	1063	1059	907	108	1089	94.0	76.7	16.6	13.42
20.10	20.70	29.50	26.45	54.40	47.25	29.95	53.15	52.95	45.35	5.40	54.45	42.00	38.35	8.30	6.210
'	"	'	"			1	56				5		42.67		
59	20.40	0	27.97	0	50.82	2	41.55	0	49.15	21	29.92	0	40.48	2	35.20
	+ 18.42		− 47.02	+	21.68	−	42.93	+	26.69	−	41.31	+	30.37		
59	38.82		40.95	1	12.50		13.62	1	15.84		18.61	1	33.04		
−23	356 50.47		52.60	38	24.15		25.27	38	27.49		30.24	38	24.69		
				3									50		
+65	57 14	58	22	56	58	58	04	56	46	58	7	56	10		
	2.10829	2.10869		2.10822		2.10858		2.10815		2.10858		2.10815			
	+3127	+3127		+2355		+2355		+3020		+3070		+3846			
	2.13956	2.13996		2.13177		2.13213		2.13885		2.13928		2.14661			
	−137.80	−138.03		−135.45		−136.06		−137.67		−137.81		−140.16			
	+ .05	+ .29		+ .06		+ .20		+ .09		+ .23		+ .12			
	− .47	− .05		− .25		− .59		− .24		− .60		− .21			
	+ .14	+ .02		+ .03		+ .08		+ .03		+ .08		+ .03			
	−2 18.15	−2 17.77		−2 15.61		−2 15.82		−2 17.79		−2 18.10		−2 20.22			
−23	39 8.62		10.37	40	39.76		41.09	40	45.28		48.36	40	44.91		
	39 9.50	+2	4.79	40	40.42	+3	57.17	40	46.81	+3	56.74			+3	56.72
			−2.1				−1.8				−2.4				−2.4
			+3.9				−15.9				−0.5				−0.2
		+2	5.99			+3	39.47			+3	53.84			+3	54.12
	−23	37	35.9			37	0.95			36	52.98			36	50.79

−23° 37' 27.3"
−23 36 57.06
36 51.88

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Perrotin

| | | |

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ζ Persei Min. α₀ — Jan 11.8 — Dec 6 — Jan 31 — Dec 12 — Jan 2 — Jan 4

15h 48m 33s — Lond — +78° 10' 41" — dα/dt — dδ/dt — +101° 49' 19" — δ₀ — −59° 26' 31" — Lond

log cos δ 9.31159 — log I 1.50270

15 Cor Stanis 9.43654 Jan 1876 — 9.43395 Dec. 1876. Jan 1877 — I 1026 — ½I 513

tang δ −4.78 −4.89

sin z −.86

1876 +.06 +.10 + Jan 11 — +.01 + Jan 31 — −.40 — −.25

Dec. 12 ×

47	59.7	47	54.4	48	14.2	48	—	46	48.0	47	13.8	46	9.2	46	40.2	46	22.0	46	38.3
			38.1				—		53.8		18.4		21.9		45.3		28.0		43.6
			55.0				—		1.3		23.9		28.1		50.7		36.2		47.7
			10.2				—				28.6				55.6				53.0
			15.1				7.70 7.7				34.0				1.0				58.5
49	28.5		24.0	48	6.6		.67 12.7				38.5				6.0				3.5
	39.9		24.7		10.7		[24] 17.3				43.9				10.7				8.4
	46.4		29.6		21.0		.11 22.8				49.7				16.2				13.0
			38.4				.78 27.9				54.3				20.8				18.6
			2535								3051				2465				2846
47	59.70		1335	48	14.20			46	54.37			46	19.73		65	46	28.73		5246
49	38.27	48	14.83	49	12.77	48	7.715			47	33.900			47	0.722			46	58.289
	+15.08	48	28.619		+23.17	48	30.544		+48.01	48.	24.257	+1	23.10	48	25.441	+1	26.13	48	25.546
	−.29		13.79		−.05		− 22.83		+2.87		− 50.36		+1.91		− 84.65		+1.20		− 87.22
	−.49		14.08				− 23.12				− 50.65				− 84.94				− 87.51
	+ 2.59				+.67				+ 6.95				+ 5.84				+5.70		
	+16.89				+23.79				+57.83			+1	30.85			+1	33.03		
+48	31.72				+31.51				+31.73				+31.57				+31.32		
	+ 15.13		−.29				−.05				+2.87				+1.91				+1.20
	1.17984		−.49																
	0.61638n																		
			−83.111		−6.48		−65.05		+39.53				+40.99				+29.56		
ℰ	ℋ		1.92137n		0.81158n		1.81325n		1.59693				1.61268				1.47070		
ℊ	ℋ		1.35791		0.24812		1.24979		1.03088n				1.04663n				0.90465n		
35	1	35	1	35	1	35	1	35	3			35	3			35	3		
477	555	212	278	361	416	212	247	472	533			414	301			394	482		
560	459	282	207	459	266	300	232	524	262			444	181			428	152		
1037	1014	94	85	820	782	512	99	996	815			58	682			822	634		
5185	6070	2470	2425	4100	3910	2560	2495	4980	4075			4290	3410			4110	3170		
36	51.27	36	24.47	36	40.05	36	25.27	38	45.28			38	38.50			38	36.40		
	− 4.13		+ 22.80		+ 1.77		+ 17.77		− 10.74				−11.13				− 8.03		
36	47.14		47.27	36	41.82		43.64	38	34.54			38	27.37			38	28.37		
+101	46		1.08	46	6.53		5.31	44	13.81			44	20.88			44	19.98		
							41												
−59	25	15	25	42	25	26	25	37	25	08		25	14			25	17		
	1.98735		1.98750		1.98748		1.98750		1.98730				1.98735				1.98756		
	+3386		+3385		+3182		+3182		+2369				+3081				+3855		
	2.02070		2.02085		2.01873		2.01882		2.01099				2.01816				2.02593		
	+104.88		+104.92		+104.41		+104.43		+102.52				+104.27				+106.15		
	+ .02		+ .77		+ .01		+ .47		+ .17				+ .19				+ .10		
	− .13		− .10		− .19		− .15		− 1.18				− 1.08				− 1.08		
	+ .07		+ .06		+ .07		+ .06		+ .15				+ .14				+ .15		
	+144.84		+145.65		+144.30		+144.81		+141.70				+143.52				+145.32		
+101	47	46.05		46.73	47	50.83		50.12	45	55.51			46	4.50			46	5.30		
	47	46.39	+2	47.46	47	50.47	+2	4.19			+3	57.17			+3	56.74			+3	56.72
	10	5.8		4.4	10	1.5		+2.0	49	56.8		+1.8	50	3.7		+2.3	50	4.3		+2.3
	49	54.2		+1.6																
	+2	7.8		−24.0	+2	8.0		−28.3	+4	1.2		−26.5	+3	59.2		−33.5	+3	59.0		−34.1
		7.5	+1	41.64		7.7	+1	37.89		0.9	+3	32.47		58.9	+3	25.54		58.7	+3	24.92
101			+49	28.03			+49	28.36			+49	27.98			+49	30.04			+49	30.22

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Perrei 20

h m s
49 28 Conv
39° 38' 47" dec

+ 2° 44' 01" D

Cond

dD

1876

Dec. 12 +

m s
49 32.050
+ .16
+ 4.00.26
38 57.81
+ .5
+ 10.788

1877

−.60

h m s
3 48 29.3
31.6
34.9

m s
48 34.1
36.9
39.4
44.9
47.5
50.2
52.9
55.6
1.0
8.5
6.4
3724
5524

h m s
48 31.93
49 30.10

48 50.218

+48.01
−.50
49 87535
4732
− 47.48
−548
+42.03
+49 32.25
+18.29
1.26221
1.27104

−39.88
1.60076n
1.60959n

45 2
31 95

3.2 442
6.3 1137
3.15 5685

47 30.00

+ 1866
47 18.66

+39 35 29.69
43 07

+2 16 53

0.43685
+2382
0.46067
−2.88

− .09
− .62
+ .08

− 3.52

39 35 26.17
35 26.21
39' 22.3
+3 56.1
56.6

+38 58.68

Jan. 2 ×

47 53.9
36.5
59.2
48 5.23
54.8
87.4
47 56.53
48 54.93

−.50

+1 23.10
−.33
+1 17.26
+32.28
+1 32.03

+18.29
1.26221
1.27104

+1 18.49
1.26694
1.27577

48 3

48 3

−.33

+1 17.26
+32.28

−39.91
1.60108n
1.60991n

45 3

1.2 75
576 367
1208 1042
1.95 55.35

48 38.65

+ 1887
47 15.12

35 33.23

44 04
0.43980
+3084
0.46774
−29.94

− .09
− .43
− .57
+ .08

− 3.52

35 29.71
35 28.86
39 24.85
+3 55.6
56.1

+38 58.70

47 5.90
1.7
4.4
9.6
12.3
15.0
17.7
20.3
25.8
28.4
31.0
2252
1652
47 15.018

47 5.90
1.7
4.4
9.6
12.3
15.0
17.7
20.3
25.8
28.4
31.0
2252
1652
47 15.018

48 5.23
54.8
87.4

48 54.93

49 37560
−.33
− 82.54
− 82.70
−5.51
+1 17.26
+32.28
+1 32.03

+18.29
1.26221
1.27104

−39.91
1.60108n
1.60991n

45 3

0.7 72
582 417
1189 1086
59.45 54.45

48 36.95

− 40.73
16.22

32.13

44 04
0.43980
+3084
0.47034
−29.54

− .43
− .87
+ .12

− 4.13

35 29.69
35 29.25
39 23.7
+3 55.4
55.9

+38 58.70

47 4.46
47.3
50.6
47 47.9
48.0
52.5
47 47.50
48 50.13

+1 26.13
−.21
+1 20.41
+32.25

−.33

+24.34
1.38632
1.39515

45 1

559 27
530 282
89 919
5445 4595

46 50.20

+ 2484
47 15.04

45 33.31

42 57
0.43660
+3855
0.47565
−29.86

− .16
− .54
+ .07

− 3.62

35 29.69
35 29.25
39 24.7
+3 55.4
55.9

+38 58.87

47 55.9
58.4
1.1
6.5
9.3
11.8
14.5
17.1
22.6
25.2
27.9
2503
13.03
11.845

49. 37560
8542
− 85.88
−5.51
+1 20.41
+32.25

−.21

−38.29
1.58300n
1.59192n

45 2

574 48
565 372
1159 1620
5765 5100

47 54.8

− 39.08
15.40

32.95

44 01
0.43920
+3855
0.47775
−30.04

− .40
− .87
+ .12

− 4.15

35 28.80
35 26.72
39 24.7
+3 56.9
56.9

+38 58.87

log cos δ 9.88647
15 constant 0.00883

tang δ + 0.83 +1.30
sin z + .05

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M.t

ζ Eridani

3h 52m 12s

−13° 51′ 55″

+56° 14′ 43″

| | m | s | | |

1876phae.proj.1481.

	1876		1877							
	m	s	m	s	1877	m	s			
α	58	14.85	58	31.25	Jan 0	58	42.76	− 14	11.8	
					5		42.12	− .64	3.2 +14	
					10		41.39	1.72	4.5 13	
					15		40.56	1.83	5.7 12	
					20		39.64	.92	6.7 10	
Corrα		+ .33								
$\frac{d\alpha}{dt}$		+ 16.8649		+ 16.8830						
δ_0		13 30.57		13 40.76						
Corrδ		− .4								
$\frac{d\delta}{dt}$		+ 10.198		+ 10.176						

| | | | | | | | |

1876phae.proj.1481

.0 Eridani

4 5 46

−7 9 57

+49°32' 45"

α_0 m 5 48823 — Jan 1: 5 49.91 2 9 41.0 6

Corrα − .02 — 6: 49.89 3 41.6 6

$\frac{d\alpha}{dt}$ +2.9250 — 11: 49.86 4 42.2 5

16: 49.82 4 42.7 5

21: 49.78 4 43.2 4

δ_0 9 45.38 — 1877 Jan 0: 5 53.16 2 9 30.6 6

Corrδ + .7 — 5: 53.14 2 31.2 6

$\frac{d\delta}{dt}$ +9.664 — 10: 53.11 3 31.8 6

15: 53.07 4 32.3 5

20: 53.03 4 32.8 5

1876 + Jan 11: +.06 +.10 — + Jan 12: +.04 — 5 52.78 — Jan 20: −.06 — 34.3 — 1877 Jan. 4: −.25

5 13.2	5 22.2	5 22.3	5 22.0	5 5.0	5 18.1	4 14.0	4 14.6	
15.1	24.3	24.2	24.0	6.7	20.3	15.8	16.6	
17.2	26.3	25.7	26.0	8.6	22.5	18.2	18.7	
	30.4		30.3		26.7		22.9	
	32.8		32.3		28.7		25.0	
6 2.1	34.8	6 10.3	34.4	5 54.1	30.8	5 3.3	27.0	
8.6	36.7		36.5	56.1	32.9	4.8	29.0	
11.2	38.8		38.6	57.7	35.0	6.2	31.1	
	43.0		42.7		39.2		35.3	
	45.0		44.8		41.2		37.4	
	47.1		46.9		43.3		39.6	
	3814		3785		3391		2972	
5 15.17		5 24.07		5 6.77		4 16.00		
6 8.97	5 34673	6 10.30	5 34409	5 55.97	5 30827	5 4.76	4 27018	

+15.09	5 49858	+15.40	5 49850	+18.91	5 49786	+1 26.16	5 53143
−.01	− 1518	−.00	− 1544	+.01	− 1896	+.03	− 8612
+.10	− 15.18		− 15.44		− 18.96		− 86.12
−1.04		−1.03		−.96		−4.32	
+14.14		+14.37		+17.96		+1 21.87	
+5 48.87		+48.78		+48.79		+48.89	

1876 1877 0

+19.50	−.01	−.00		+.01		+.03	
1.29003	+.10						
1.41157							
	−34.30	+10.34	−35.89	+21.06	−25.14	+11.02	−37.75
E F	1.535292	1.01452	1.554474	1.38130	1.440374	1.04218	1.541922
G H	1.65683	1.13606	1.67651	1.50284	1.52191	1.16113	1.69587
30 32	30 4	30 3	30 4	30 2	30 3	30 4	35 0
" "							
53.0 51.5	4.0 2.2	6.0 2.3	7.6 4.2	4.86 4.95	5.46 5.51	3.03 1.72	5.72 5.72
55.0 56.9	5.0 7.1	5.8 7.3	6.2 9.5	5.43 5.11	5.53 5.57	4.61 2.87	5.23 3.68
80 84	90 93	118 96	139 137	1009 1006	99 8	964 799	95 94.0
54.02 54.20	4.50 4.65	5.90 4.80	6.95 6.85	5.045 5.030	5.495 5.540	4.820 3.995	5.475 4.700
33 54.10	34 4.57	33 5.85	34 6.90	32 5.037	33 5.517	34 4.408	35 5.088
+ 26.80	− 45.38	+ 13.68	− 47.48	+ 31.33	− 33.26	+ 14.49	− 49.64
34 19.90	19.19	33 19.03	19.42	33 22.20	21.91	34 58.57	1.24
33 34 (91)							
−7 17 9.845	30.84	10 30.68	31.07	10 33.85	33.56	12 10.22	12.89
0 31.58							

+49 30 48	31 59	30 59	32 01	30 44	31 49	30 51	31 58
1.82882	1.82860	1.82840	1.82860	1.82836	1.82855	1.82835	1.82860
+3345	+3383	+2905	+2905	+2246	+2266	+3880	+3880
1.86202	1.86232	1.86745	1.86765	1.85096	1.85121	1.86715	1.86740
−72.8278	−72.83	−72.02	−72.05	−70.85	−70.99	−73.65	−73.69
+ .02	+ .08	+ .01	+ .08	+ .04	+ .04	+ .01	+ .10
− .2710	− .29	− .22	− .26	− .25	− .35	− 1.41	− .24
+ .1662	+ .16	+ .12	+ .16	+ .11	+ .16	+ .19	+ .03
11 − 72.984	− 72.88	− 72.11	− 72.18	− 71.05	− 71.14	− 74.86	− 73.80
−7 12 44.4639	43.72	11 42.79	43.17	11 44.90	44.70	13 25.08	26.69
12 11 41.09	+2 4.64	11 42.98	+2 3.98	11 44.80	+2 4.15	13 25.80	+3 56.72
9 42.2	−1.6	9 42.3	−1.6	9 43.1	−1.6	9 31.51	−2.0
+3 1.9	✓ −+3.2	+2 1.7	−+3.1	+2 1.7	−+2.3	+3 54.8	−+1.3
26	+1 59.24	2.4	+1 59.25	2.4	+2 0.25	55.5	+3 40.4

77 −7 −9 44.82 −9 43.70 −9 44.55 −9 45.47

Log cosδ 9.99659

1 cosδ tanι 0.1 ~~1554~~ 1.554 Jan. 1876

0.11895 Jan 1877 2.08

tanδ − 0.13 + 1.01

sin z + .76

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Jani

α 4 12 41

Conα

+15° 19' 26"

dδ/dt

δ₀ +27 8 22

Conδ

dδ/dt

1876 + Jan 10 −.04

α 12 44269 +.02 +3.4070 19 35.28 −.6 +9.032 +.06 +.10

Conα

dα/dt

δ₀

Conδ

dδ/dt

+ Jan 11

Jan 11 16 21 26 31 Feb 5 10 15 20 25 Mar 1 6 11 16 21

12 4525 45.22 45.19 45.14 45.09 45.03 44.97 44.90 44.82 44.74 44.65 44.57 44.50 44.42 44.35

3 19 3 5 5 6 7 8 8 9 8 7 8 7

44.4 44.3 44.1 44.0 43.8 43.7 43.6 43.5 43.3 43.2 43.1 43.0 42.8 42.7 42.5 −.06

+.04

+ Jan 12

+ Jan 20

log cos δ 9.98426

15 cos δ tan α 0.10921

tang δ + 0.27 +1.04

sin 2 + .46

I 2/3

−.02 + Feb. 7

−.15 −.10 Mar. 7

+ 1

+ 2

m s 12 9.8 11.7 13.5	m s 12 17.4 19.5 21.7 26.0 28.1	12 24.1 26.4 28.6	12 17.3 19.4 21.5 25.8 28.0	12 9.0 10.7 13.0	12 17.0 19.1 21.2 25.6 27.7	11 59.1 1.0 2.7	12 13.6 15.7 17.9 22.0 24.2	12 58.2 0.3 2.0	12 5.5 7.6 9.7 14.0 16.2	12 23.7 25.5 28.1	11 52.8 54.9 57.0 1.1 3.3		
13 7.0 8.8 10.2	30.3 32.4 34.6 38.8 40.9	12 43.9 45.9 48.5	30.0 32.1 34.4 38.6 40.7	13 4.8 6.4 8.2	29.9 32.0 34.1 38.4 40.5	12 46.5 48.7 50.1	26.4 28.4 30.6 34.8 37.0	12 40.6 42.8 44.5	18.4 20.5 22.5 26.9 29.0		5.7 7.7 10.0 14.1 16.3		
12 11.67	33.28	12 26.37	33.07 .03	12 10.90	32.82	12 0.93	28.97	12 0.17	20.14	12 25.77	18.3 24.19 6.19		
13 8.64	12 30.255	12 46.10	12 30.064	13 6.47	12 29.836	12 48.53	12 26.336	12 42.67	12 18.309	2'	12 56.27		
+15.01 −.01	12 45.254	+15.09 +.02	12 45.248	+15.41 +.01	12 45.242	+18.91 −.02	12 45.194	+27.80 −.00	12 45.223	+37.19 −.04	12 44.552		
	−15.00	+.10	−15.17		−15.41		−18.86		−26.69		−38.92		
−.98 +14.02 +12 44.28	−15.02	−.97 +14.24 +44.31	−15.19	−.97 +14.45 +44.29	−15.43	−.92 +17.97 +44.31	−18.88	−.73 +27.07 +45.38	−26.71	−.10 −2.8 +38.77 +44.10	−38.94		
	−.01		+.02 +.10		+.01		−.02		−.00		−.04 −.10		
+18.58 1.26905 1.37826	+ 19 34.17		19 35.57		19 34.36		19 35.22		19 35.18		19 34.90		
	−38.42	+3.70	−16.03	+18.94	−36.63	+2 35.41	−22.19	+18.14	−24.32	−20.14			
E F	1.584562n	0.56820	1.20493n	1.27738	1.563841n	1.40500	1.346162n	1.258644	1.385962n	1.304062n			
G H	1.693777n	0.67741	1.31414n	1.38659	1.67305n	1.51421	1.455377n	1.367855	1.493172n	1.413272n			
0 4	5 0	0 4	0 4	0 4	5 0	0 4	5 0	0 4	5 0	5 0			
12.1 12.6	25.2 24.7	29.9 31.8	55.6 55.7	10.3 8.2	21.7 21.9	1.0 4.7	3.8 7.2	12.2 13.6	6.5 8.5	6.5 6.9			
10.9 9.3	23.8 25.1	31.1 32.9	55.1 57.2	18.2 13.8	20.7 27.1	3.0 4.0	4.0 5.6	15.2 17.9	7.9 12.9	11.7 16.0			
3.0 2.19	9.0 11.3	6.10 4.7	7 12.9	8.5 22.0	2.4 9.0	4.0 7	7.8 12.8	7.4 11.5	14.4 21.4	18.2 22.9			
11.50 10.95	24.50 25.65	30.50 32.35	55.35 56.45	14.25 11.00	21.20 24.50	2.00 4.35	3.90 6.40	13.70 15.75	7.20 10.70	9.10 11.45			
4 11.22	5 25.07	4 31.42	4 55.90	4 12.62	5 22.85	4 31.71	5 5.15	4 14.72	5 8.95	5 10.27			
+ 23.89 4 35.11	− 49.40 35.67	+ 4.76 4 36.18	− 20.61 35.29	+ 24.35 4 36.97	− 47.10 35.75	+ 32.67 4 35.84	− 28.53 36.62	+ 23.33 4 38.05	− 31.27 4 37.68	− 25.90 4 44.37			
+5 18 13.24		18 12.17	12.68	18 11.38	13.06	18 12.51	12.60	18 10.30	11.73	18 10.67	18 3.98		
+27 2 06	3 19	2 25	2 60	2 07	3 17	1 57	2 59	2 8	3 03	3 04			
1.46805	1.46840	1.46810	1.46825	1.46805	1.46840	1.46795	1.46830	1.46805	1.46830	1.46835			
+2269	+2269	+3385	+3385	+2914	+2914	+2269	+2269	+1638	+1638	−481			
1.49074	1.49109	1.50195	1.50210	1.49719	1.49754	1.49064	1.49099	1.48443	1.48468	1.46354			
−30.96	−30.98	−31.76	−31.78	−31.42	−31.44	−30.95	−30.97	−30.61	−30.53	−29.08			
− .04	− .20	− .00	− .03	− .05	− .18	− .08	− .07	− .04	− .08	− .05			
− .29	− .03	− .31	− .34	− .29	− .03	− .37	− .01	− .50	− .01	− .03			
+ .17	+ .02	+ .06	+ .20	+ .14	+ .02	+ .18	+ .00	+ .17	+ .04	+ .01			
−31.12	−31.19	−32.01	−31.95	−31.59	−31.63	−31.24	−31.05	−30.88	−30.58	−29.15			
+1 5 17 42.12	41.49	17 40.16	41.11	17 39.79	40.97	17 41.27	40.68	17 39.42	17 40.09	17 34.83			
17 41.80	+2 2.37	17 40.63	+2 4.04	17 40.38	+2 3.98	17 40.97	+2 4.15	17 39.72	+2 4.85		+2 8.87		
19 44.4	−0.9	19 44.4	−0.9	19 44.4	−0.9	19 44.1	−1.0	17 43.7	−1.1	19 43.0	−1.1		
+2 2.6	−+9.1	+2 3.8	−+9.1	+2 4.0	−+9.1	+2 3.1	−+8.9	+2 4.0	−+8.4	+2 8.2	−+7.7		
2.0	+1 52.37	3.2	+1 54.94	3.4	+1 55.98	2.5	+1 54.23	3.4	+1 55.35	7.6	+2 9.07		

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δ Tauri

α 4h 15m 44s

+17° 14′ 51″

+25° 07′ 57″

1876

α₀ 15m 47s.088

Cor α +.03

dα/dt +3.4607

δ₀ 14° 69′ 42″

Cor δ +.0

dδ/dt +8.781

Jan 1 | 15 48.13 | 15 9.2

6 | 11 | 16 | 21

48.12 | 48.10 | 48.07 | 48.03

1 | 2 | 3 | 4

9.1 | 9.0 | 8.9 | 8.8

log cos δ 9.98331

15 cos δ tan α 0.10496

tang δ +0.31 +1.05

sin z +.42

−.04 +.06 +.10 −.06

+ Jan. 10 + Jan. 11 + Jan. 20

15 5.0	15 20.1	15 15.7	15 19.9	15 2.4	15 16.2
7.3	22.3	17.6	22.1	4.7	18.4
7.0	24.5	19.6	24.2	6.6	20.5
	28.8		28.6		24.9
	31.0		30.8		27.0
16 16.8	33.1	15 37.0	32.8	15 34.7	29.1
	35.2	8.2	35.1	36.6	31.3
	37.3	1.0	37.1	38.0	33.5
	41.8		41.5		37.8
	43.9		43.7		40.0
	46.1		45.8		42.2
	3643		3616		3209
15 7.10		15 17.63		15 4.63	
16 16.80	15 33.118	15 38.40	15 32.873	15 36.77	15 29.182
+15.01	15 48.103	+15.10	15 48.099	+18.91	15 48.036
−.01	−14.98	+.02	−15.23	−.082	−18.86
	−15.01	+.10	−15.26		−18.89
−1.02		−1.02		−.95	
+13.98		+14.20		+17.94	
+15 47.10		+47.07		+47.11	
	−.01		+.02		−.06
			+.10		

+26.02
1.41531
1.52827

	−43.68	+15.24	−25.53	+24.54	−27.60
ε π	1.640282	1.18298	1.40705	1.38987	1.44091
g π	1.74524	1.28794	1.51201	1.49483	1.54587
5 3	10 0	5 3	5 4	5 3	5 4
40.4 39.6	8.0 8.3	53.7 53.5	46.2 44.3	41.7 44.5	48.1 47.9
39.6 38.0	6.4 5.1	54.8 56.4	44.9 48.2	43.8 44.4	49.2 49.4
800 176	144 134	83 99	111 125	53 9	173 13
40.00 38.80	7.20 6.70	54.25 54.95	45.55 46.25	42.75 44.45	48.65 49.65
8 39.40	10 69.5	8 54.60	9 45.90	8 43.60	9 49.15
+ 33.13	− 55.62	+ 19.41	− 32.51	+ 31.25	− 35.15
9 12.53	11.33	9 14.01	13.39	9 14.85	14.00
+17 13 35.82	37.02	13 34.34	34.96	13 33.60	34.85
+25 6 33	8 01	6 49	7 40	6 38	7 43
1.43105	1.43150	1.43115	1.43140	1.43110	1.43140
+2269	+2269	+3385	+3385	+2269	+2269
1.45374	1.45419	1.46500	1.46525	1.45379	1.45409
−28.43	−28.46	−29.17	−29.19	−28.43	−28.45
− .10	− .28	− .03	− .10	− .10	− .11
− .26	− .01	− .27	− .34	− .33	− .43
+ .15	+ .00	+ .16	+ .19	+ .15	+ .19
−28.64	−28.75	−29.31	−29.44	−28.41	−28.80
+17 13 7.18	8.27	13 5.03	5.52	13 4.99	5.55
13 7.72	+2 2.37	13 5.27	+2 4.04	13 5.17	+2 4.15
15 9.0	−0.9	15 7.0	−0.9	15 8.8	−0.9
+2 .3	−0.6	+2 3.7	−0.6	+2 3.6	−0.4
13 8.3	+1 3.87	13 3.7	+1 3.55	13 3.6	+1 3.95

14 59.59 14 58.81 14 59.02

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η Piscis Min. λ_0 16 21 11 $+76^\circ$ 2' 32"

β_0 $+103^\circ$ 57' 28"

Ω -61° 34' 40"

Conv $\frac{d\lambda}{dt}$ $\frac{d\beta}{dt}$ Corr'

1876

| | | |

1876phae.proj.14811

α Tauri

α_0 — m s — 28 48.390

Corr — − .01

$\frac{d\alpha}{dt}$ — + 3.4364

δ_0 — 15 29.45

Corr — − .3

$\frac{d\delta}{dt}$ — + 7.605

α 4h 28m 45s

δ +16° 15′ 22″

+26 7 26

1876

log cos δ 9.98229

15 Constant 0.10724 Jan. Feb. Mar. / 0.10422 July

Long 8 + 0.29 + 1.04

sin z + .44

log R-2 1.28899

R-2 19.454

I 2.14

I′ .130

	+ Jan 10			+ Jan 11			+ Jan. 12			+ Jan. 26	
	−.04			+.06			+.04	See third page for Jan. 20		+.02	
	28 7.9	28 11.1	28 21.6	28 14.4	28 10.9	28 21.4	28 26.4	28 10.6	28 21.1	28 12.1	28 4.7	28 15.3
	10.0	13.1	23.7	16.7	13.0	23.5	28.2	12.7	23.2	14.1	6.8	17.5
	11.6	15.3	25.9	19.0	15.1	25.7	30.2	14.8	25.1	16.1	9.0	19.4
		17.5	30.1		17.3	30.1		17.0	29.9		11.3	23.7
		19.7	32.2		19.2	32.1		19.1	32.0		13.4	25.8
	29 3.2	4.9.6	34.4	29 5.2	44.4	34.3	29 4.1	47.2	34.0	29 2.0	43.5	28.1
	5.0	57.8	36.7	7.3	51.6	36.4	6.8	57.4	36.2	8.9	45.7	30.3
	7.3	57.0	38.8	9.4	53.8	38.3	8.9	53.5	38.3	5.8	47.8	32.0
		56.0	43.0		53.9	43.0		53.7	42.4		50.0	36.7
		58.3	53940 45.3		58.1	53760 45.8		57.8	53520 44.8		52.2	38.7
			47.4			47.2			46.9			41.6
		3464	3790		3445	3772		3418	3744		2844	3096
	28 9.83			28 16.70			28 28.27			28 14.10		
	29 5.17	28 34.540	28 34.455	29 7.30	28 34.450	28 34.291	29 6.60	28 34.170	28 34.036	29 3.90	28.440	28 28.091
			510			320			050			310
			28 34.482			28 34.306			28 34.043			28 28.205
		+15.02	28 49473		+15.11	28 49469		+15.42	28 49465		+21.18	28 49358
		−.01	− 1499		+.02	− 15.16		+.01	− 1542		+.00	− 21.15
			− 14.98		+.10	− 15.15			− 15.41			− 21.14
		−1.08			−1.08			+.08			−.97	
		+13.93			+14.15			+14.35			+20.21	
		+28 48.41			+ 48.46			+ 48.39			+ 48.41	
			−.01			+.02		+.01			+.00	
						+.10						
	+24.65											
	1.39182											
	1.49906											
		−30.69	+17.61	−32.96	−32.99	−	+ 5.77	−32.56	KUNZ	+14.10 +34.98	−35.70	
	E F	1.48700		+17.69			0.76118	1.51268		1.14922	1.55267	
	G 16	1.59424		1.24576	1.51838		0.86842	1.61992		1.25646	1.65991	
				1.33300	1.62562							
	5 3	5 4	5 3	5 3	5 4		5 3	5 4		5 3	5 4	
	" "	216 206	188 188	193 188	249 238		333 318	232 210		244 223	278 263	
	9.9 9.9	198 201	211 238	211 238	238 278		341 381	222 276		245 263	266 295	
	200 10	414 7	404 426	404 426	87 116		74 99	54 86		9 86	144 158	
	10.00 9.50	20.70 20.35	20.20 21.30	20.20 21.30	24.35 25.80		33.70 34.95	2270 24.30		2445 24.30	27.20 27.90	
	' "	' "	' "	' "	' "		' "	' "		' "	' "	
	8 9.75	9 20.32	8 20.75	9 25.07			8 34.32	9 23.50		8 24.37	9 27.55	
	+ 31.55	− 39.29	+ 22.54	− 42.23			+ 7.39	− 41.68		+ 18.05	− 45.70	
	8 41.30	41.23	8 43.29	42.84			8 41.71	41.82		8 42.42	41.85	
+16	14 7.05	7.12	14 5.06	5.51			14 6.64	6.53		14 5.93	6.50	
	4											
26	6 02	7 15	6 15	7 19			6 28	7 18		6 18	7 22	
	1.45035	1.48065	1.45035	1.45078			1.45045	1.45070		1.45040	1.45070	
	+2339	+2339	+3422	+3422			+2944	+2944		+3725	+3725	
	1.47374	1.47404	1.48457	1.48492			1.47989	1.48014		1.48765	1.48795	
	−29.77	−29.79	−30.52	−30.54			−30.19	−30.21		−30.74	−30.76	
	− .08	− .13	− .05	− .16			− .01	− .15		− .03	− .19	
	− .22	− .30	− .23	− .31			− .25	− .31		− .34	− .45	
	+ .13	+ .17	+ .13	+ .18			+ .14	+ .18		+ .14	+ .18	
	−29.94	−30.05	−30.67	−30.83			−30.31	−30.49		−30.97	−31.22	
+16	13 37.11	37.07	13 34.39	34.68			13 36.34	36.04		13 34.96	35.28	
	13 37.09	+2 2.37	13 34.54	+2 4.04			13 36.19	+2 3.98		13 35.12	+2 4.74	
	15 38.7	−0.9	15 38.7	−0.9			15 38.7	−0.9		15 38.4	−1.0	
	+2 1.6	+9.3	+2 4.2	+9.3			+2 2.5	+9.3		+2 3.3	+9.0	
	1.3	+1 52.17	3.9	+1 53.84			2.2	+1 53.78		3.0	+1 54.74	
16		+15 29.26		+15 28.38				+15 29.97			+15 29.86	

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Jan 1 … Feb 26 … Mar 5 … 15

m s / " / "

28 49.49 1 15 38.9 1
49.48 1 38.8 1
49.47 3 38.7 1
49.44 3 38.6 1
49.41 5 38.5 1
49.36 5 38.4 1
49.31 6 38.3 1
49.25 6 38.2 1
49.19 7 38.1 1
49.13 7 38.0 1
49.05 8 37.9 1
48.97 9 37.8 2
4888 37.6 2

+.01 +.09 +.02 −.03

Jan 31 Feb 2 Feb 7 Feb 8

m s m s m s / 27 58.6 28 26 28 13.3 / 27 58.5 28 2.0 28 12.5 28 20.7 28 58.8 28 9.5 27 53.7 27 58.0 28 9.3
0.2 4.9 13.4 1.0 4.0 14.7 22.9 0.9 11.6 57.9 0.8 11.3
1.6 7.0 17.6 2.9 6.3 16.8 25.0 3.0 13.6 59.4 3.0 13.6
9.1 21.8 8.4 21.0 5.1 18.1 5.1 17.9
11.2 6.960 24.0 10.5 23.3 7.4 20.3 1.3 3040 2.00
28 48.2 41.4 26.0 28 46.0 40.7 42.8 23.5 28 58.5 0.2 37.4 22.4 28 38.0 37.4 22.2
50.3 43.4 28.1 47.4 49.4 44.9 27.6 2.6 39.4 24.6 39.5 24.3
52.0 45.6 30.3 46.9 29.8 41.9 26.4 41.7 26.3
47.9 34.7 34.0 44.0 31.1 43.8 30.6
47.9 45.640 36.9 49.1 36.2 46.1 33.1 46.0 41.680 32.9
39.0 88.4 33.3 33.0

2630 2871 2566 2798 2243 2462 2836 2438

28 0.13 28 1.13 28 22.87
25 50.17 28 26.300 28 26.100 28 47.60 28 25.560 28 25.436 29 04.3 28 22.430 28 24.200 28 38.62 22.360 26 22.164
.170 .430 .300 .230
28 26.135 28 25.433 28 24.341 28 22.197
+23.18 28 49.307 +23.82 28 49.283 +27.80 28 49.223 +27.01 28 49.211
+.00 − 23.17 +.03 − 23.385 −.00 − 24.88 −.01 − 27.01
− 23.316 − 23.384 − 24.87 − 27.00
−.92 −.89 −.83 −.82
+22.26 +22.96 +26.97 +26.18
+28 48.40 +48.39 +49.31 +48.38

+26.00 +.00 +.03 −.00 −.01
1.41147
1.52221

− 58.04 − 24.04 +24.30 − 22.17 − 36.09 +24.43 − 15.80
E 1.39938 n 1.38093 n 1.38561 1.34577 n 9.72428 n 1.58081 n 1.38792 1.19866 n
G R 1.80658 n 1.48817 n 1.49285 1.45301 n 1.49516 1.30590 n

5 3 5 4 5 3 5 4 5 3 5 4

94 87 126 113 121 107 107 100 431 450 304 319 103 124 25 32
114 134 126 162 107 122 94 116 464 497 311 356 132 181 32 86
208 221 - 75 28 29 201 16 95 147 15 75 35 105 57 118
1040 1105 1260 1375 1140 1145 1005 1080 4475 4735 3075 3375 1175 1525 285 590
' " ' " ' " ' " ' " ' " ' " ' "
8 1072 9 1317 8 1142 9 1042 8 4605 9 3225 8 1350 9 437
+ 33.28 − 44.06 −30.77 + 31.11 − 28.38 − 46.20 48.76 + 31.27 − 20.23
8 44.00 13 42.40 8 42.53 42.04 8 47.93 46.05 8 44.47 44.14
45.37 43.47
14 4.38 5.95 14 5.82 6.31 14 0.42 2.30 14 3.58 4.21
2.98 4.84

26 6 05 07 7 07 6 05 7 04 6 40 7 26 6 08 6 58
1.45035 1.45065 1.45035 1.45065 1.45035 1.45070 1.45035 1.45060
+3166 +3166 +3932 +3932 +1638 +1638 +2107 +2107
148201 148231 148967 148997 1.46688 1.46708 1.47142 1.47167
−30.34 −30.36 −30.88 −30.90 −29.30 −29.31 −29.61 −29.63
− .10 − .08 − .08 − .07 − .00 − .19 − .08 − .04
− .35 − .46 − .35 − .46 − .46 − .54 − .38 − .49
+ .13 + .17 + .13 + .17 + .15 + .18 + .13 + .16
−30.66 −30.73 −31.18 −31.26 −29.61 −29.86 −29.94 −30.00
16 13 33.69 35.22 13 34.64 35.05 13 30.84 32.44 13 33.64 34.21
13 34.46 +2. 4.19 13 34.84 +2 4.43 13 31.62 33.66 13 33.92 +2 5.18
15 38.3 −1.0 15 38.3 −1.0 15 38.2 +2 4.85 15 38.1 −1.0
+2 3.8 −+8.9 +2 3.5 −+8.8 +2 6.645 −1.0 +2 4.2 −+8.7
3.5 +1 54.29 3.2 +1 54.63 4.2 −+8.8 3.9 +1 55.43
+1 55.05
16 +15 28.75 +15 29.47 +15 28.41 +15 29.35
28.71

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Feb. 20 — Feb. 21 — Feb. 22 — Feb. 23

Feb. 20				Feb. 21		Feb. 22				Feb. 23			
27 46.4	27 55.2	28 5.7		27 49.4		28 5.3		27 54.5	27 34.1	28 4.6		27 53.1	27 53.7	28 4.4	
48.6	57.4	7.9				7.5		56.0	36.4	6.9		55.1	56.1	6.6	
51.4	59.6	10.2				9.6		58.0	38.4	9.6		57.8	58.2	8.7	
	1.6	14.4				13.8			40.5	13.1			0.4	12.2	
	37 59.500	16.5				16.1			21.6	58.400 15.4			2.3	58.140 13.2	
26 34.6	39.6	18.6				18.2		28 44.6	32.8	17.6			32.7	17.3	
	36.0	20.9				20.4		46.2	34.9	19.8			84.8	19.6	
	38.2	23.1				22.6		48.8	37.1	21.9			86.6	21.4	
	40.3	27.1				26.9			39.2	26.3			38.8	26.0	
	42.4	38.180 29.4				29.1			41.3	37.060 28.4			41.0	36.180 28.0	
		31.7				31.2				30.6				30.3	
	3684	2055				2007			3573	1936			3546	1904	
27 48.80	1884			27 49.40				27 56.17	1773			27 55.33	1746		
26 34.60	28 18.840	28 18.682				28 18.245		28 46.53	28 17.730	28 17.600			27 17.460	17.309	
		.710								.603				.338	
		28 18.696				28 18.245				28 17.603				28 17.328	
	+30.33	28 49.046		+30.81		28 49.030			+31.35	28 49.014			+31.71	28 48.998	
	-.03	-30.35		-.03		-30.78			+.00	-31.41			+.00	-31.68	
	-.66	-30.34				-30.77				-31.40				-31.67	
	-.66			-.64					-.62				-.61		
	+29.64			+30.04	30.4				+30.73				+31.10		
	+48.34			+48.28	48.38				+48.33				+48.42		
	+29.90	-.03		-.03					+.00				+.00		
	1.47567														
	1.58291														
		-15.90		+28.84				+21.43	-28.93			+21.99			
		1.20140		1.46000				1.33102	1.46135			1.34222			
		1.30864		1.56724				1.43826	1.56859			1.44946			
	5 3	5 4		5 3				5 3	5 4			5 3			
	" "														
	49 72	2.3 37		11.1 11.9				16.0 15.7	19.7 20.0			15.1 15.0			
	7.7 11.8	4.6 8.1		14.2 18.1				19.4 21.5	21.9 26.2			17.2 17.6			
	12.6 19.0	6.9 11.8		5.3 10.0				15.4 37.2	41.6 46.2			12.3 14.6			
	6.30 9.50	3.45 5.90		12.65 15.00				17.70 18.60	20.80 23.10			16.15 17.30			
	' "	' "		' "				' "	' "			' "			
	8 7.90	9 4.67		8 13.82				8 18.15	9 21.95			8 16.72			
	+ 38.28	- 20.35		+ 36.92				+ 27.43	- 37.03			+ 28.15			
	8 46.18	44.32		8 50.74				8 45.58	44.92			8 44.87			
+16	14 2.17	4.03		13 57.61				14 2.77	3.43			14 3.48			
		89													
+24	6 02	6 07		6 08				6 12	7 16			6 11			
	1.45030	1.45060		1.45035				1.45035	1.45070			1.45035			
	+2510	+2870		+2616				+1993	+1993			+3985			
	1.47540	1.47570		1.47651				1.47028	1.47063			1.49020			
	-29.88	-29.90		-29.96				-29.63	-29.64			-30.92			
	- .13	- .04		- .12				- .06	- .12			- .07			
	- .43	- .57		- .48				- .50	- .64			- .50			
	+ .12	+ .16		+ .13				+ .13	+ .17			+ .13			
	-30.32	-30.35		-30.43				-29.96	-30.15			-31.36			
+16	13 31.85	33.68		13 27.18				13 32.81	33.28			13 32.12			
	13 32.76	+2 6.73			+2 5.60			13 33.04	+2 6.02				+2 5.45		
	15 37.9	-1.1		15 37.9	-1.1			15 37.9	-1.1			15 37.8	-1.1		
	+2 5.1	-+8.5		+2 10.7	-+8.5			+2 4.9	-+8.4			+2 5.7	-+8.4		
	4.8	+1 57.13		10.4	+1 56.00			4.6	+1 56.52			5.4	+1 55.95		
16		+15 29.89			+15 23.18				+15 29.56				+15 28.07		

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1876phae.proj.1481:

Mar 1	m	ℓ			"	
	28	48.88	8	15	37.6	2
6		48.80	8		37.4	2
11		48.72	8		37.3	2
16		48.64	8		37.2	2
21		48.56			37.1	

June 29	m	ℓ			"	
	28	49.97	13	15	39.7	4
July 4		49.70	13		40.1	5
9		49.23	14		40.6	5
14		49.37	14		41.1	5
19		49.51	15		41.6	5
24		49.66	15		42.1	5
29		49.81	16		42.6	5
Aug 3		49.97	16		43.1	5
8		50.13			43.6	

See Y.L. for continuation p. 34

+ −.06 Jan. 20

m	ℓ	m	ℓ	m	ℓ										
28	7.4	28	7.1	28	17.6	27	37.1	27	42.9	27	53.6	28	29.5	28	36.2
	9.5		9.3		19.7		38.6		45.1		53.7		30.7		38.4
	11.7		11.4		21.8		40.2		47.2		57.1		33.5		40.5
			13.5		26.2				49.3		2.1				42.7
			15.7	11.360	28.3				51.4	47.180	4.2				44.7
29	1.2		43.6		30.4				21.5		6.3	29	40.5		14.8
	3.1		47.8		32.6				23.7		8.5		42.1		17.0
	5.0		50.0		34.7				25.9		10.8		44.9		19.2
	12.1		52.1		37.0				28.0		13.0				21.3
			54.2	49.940	41.2				30.1	25.840	17.1				23.5
					43.4						19.3				
			3065		3349				3651		2583				2983
28	9.53					27	38.63		651		703	28	3.23		
29	3.10	28	30.650	28	38.445			28	6.510	28	6.391	29	42.50	28	59.830
					.520						380				
				28	30.482					28	6.386				
			+18.92	28	49.414			+42.30		28	48.668			−10.33	
			−.02		− 1893			−.02			− 4228			−.18	
					− 1892						− 4227				
			− 1.02											−.88	
			~~+17.84~~		1784			−.28						−17.39	
			+48.32		48.36			+42.00						+48.32	
								+48.39							

m	ℓ														
28	58.727	28	31.8	28	38.4	28	49.1								
	59.0		33.7		40.6		51.3								
	59.1		35.3		42.9		53.4								
	59.5				45.2		55.7								
40.500	59.6				47.0	42.980	57.7								
	2.0	29	29.3		17.4		2.0								
	4.1		31.3		19.3		4.1								
	8.3		33.1		21.4		6.4								
					23.5		10.6								
19160	10.4				25.7	21460	12.8								
	12.6						14.9								
	8570				3212		3220								
	6570	28	33.60		6212										
28	57.727	29	31.23	29	2.120	29	2.070								
	57.714						1.990								
28	49265				−12.24	29	1.995								
	+ 10.45				−.25	28	49321								
	+ 10.46				−.07		+ 12.67								
					−.93		+ 12.68								
					−13.49										
					+48.51										

+2005			−.02				−.02				−.18				−.25
1.32118															−.07
1.42842															
		− 38.62		+ 27.76		+ 28.48		− 42.79	+			+ 28.39		− 24.24	
	7	1.57348		1.44342		1.45454		1.63134n				1.45317		1.46598n	
	16	1.62072		1.55066		1.55876		1.73556n				1.55739		1.57020n	
	5	3	5	4	5	3	5	3	10	0		5	3	10	0
	139	166	230	252	102	78	50.9	476	196	177		52.4	480	6.1	0.9
	170	174	248	261	26	168	50.1	541	20.4	21.7		51.1	540	5.5	8.4
	109	140	78	113	28	246	10	1017	400	394		3.5	1020	116	9.3
	15.65	17.00	23.90	25.65	11.40	12.30	50.50	5085	20.00	19.70		51.75	51.00	5.80	4.65
	8	16.22	9	22.77	8	18.85	8	50.67	10	19.85		8	51.37	10	5.22
	+	24.82	−	41.76	+	35.95	+	36.20	−	54.40		+	36.08	−	37.17
	8	43.04		43.01	8	54	8	~~14.47~~		~~14.25~~		9	27.46		28.05
						47.39	9	26.87		25.45					
+16	14	5.31		5.34	14	0.96	~~14~~	~~33.88~~		~~34.10~~		13	20.89		20.36
							13	21.48		22.90					
26	6	10	7	19	6	.06	5	56	7	19		5	50	7	04
	1.45035		1.46070		1.45035		1.45025		1.45070			1.45025		1.45065	
	~~+25.49~~		~~+30.10~~		+2549		±2453		±2453			−2580		−2580	
	+2275		+2273												
	1.47310		1.47345		1.47584		1.42578		1.42617			1.42445		1.42485	
	−29.72		−29.75		−29.91		−26.65		−26.68			−26.57		−26.60	
	− .06		− .14		− .11		− .11		− .26			− .11		− .12	
	− .30		− .40		− .58		− .74		− .06			− .72		− .02	
	+ .13		+ .18		+ .13		+ .15		+ .01			+ .15		+ .00	
	− 29.95		− 30.13		− 30.47		− 27.35		− 26.99			− 27.25		− 26.74	
+16	13 35.36		35.21	13	30.49	12	54.13		55.91			12	53.64		53.56
	13 35.29	+ 2	4.15			12	55.02	+ 2	46.85			12	53.60	+ 2	47.10
	15 38.5		− 0.9	15	37.2	15	40.7		−0.8			15	40.9		− 0.8
	+2 3.2		−+9.1	+2	6.7	+2	45.7		−+11.3			+2	47.3		−+11.5
	2.9	+ 1	54.15		6.4		48.4	+ 2	34.75				47.0	+ 2	34.80
				+ 2	7.84										
					−.41										
					−+7.8										
				+ 1	58.94										
16		+15	~~28.44~~ 29.44			+15	29.43			+15	29.77			+15	28.40

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Gr. 848
4h 32m 3s
+75° 42' 33"
−33° 19' 45"

λ_0 32m 10.743s Jan 11 32 14.24 20 43 0.7 11 log cos 9.39220 log I 0.92209
Cons + .17 16 14.04 23 1.8 10
$\frac{d\lambda}{dt}$ + 7.9507 21 13.81 26 2.8 9 15 cos Stan 9.51715
26 13.55 30 3.7 9
β_0 42 40.09 31 13.25 32 4.6 7 I 836
Jan 5 12.98 34 5.3 6 ½I 4.18
Cons + .1 10 12.59 36 5.9 4 tang δ + 3.92 + 4.05
15 12.23 37 6.3 3
$\frac{d\beta}{dt}$ + 7.366 20 11.86 6.6 2 sin z − .55

1876
Jan. 12 × +.04 Jan. 20 × −.06 Feb 2 × +.09 Feb. 8 × −.03 Feb. 17 × −.03 Feb 22 × +.01

Jan. 12		Jan. 20		Feb 2		Feb. 8		Feb. 17		Feb 22	
31 23.4	31 42.4	31 17.3	31 38.7	31 8.4	31 32.3	31 55.7	31 29.4	30 35.4	31 26.0	32 33.1	31 23.9
23.7	46.1	23.5	42.6	10.8	36.4	8.3	33.1	43.9	29.8	38.4	28.1
38.3	50.4	31.7	46.8	17.0	40.8	11.3	37.7	50.9	34.2	49.8	32.3
	54.4		50.7		45.0		41.8		38.3		35.8
	58.9		55.1		49.4		45.9		42.6		40.4
33 4.8	3.2	32 20.2	59.6	32 17.5	53.3	32 29.9	50.2	32 14.2	47.1	33 2.8	44.8
17.8	7.2	24.0	33.6	24.0	57.7	37.2	54.3	19.6	51.1		48.8
6.8	11.5	33.5	7.6	34.0	1.9	45.7	58.1	25.5	55.1		52.9
	15.7		12.0		6.4		2.7		59.3		57.0
	2898		3167		3232		3535		3836		3640
31 30.47	32 48	31 24.17	49.67	31 10.40	43.2	32 3.43	41.35	30 43.40		32 10.53	
33 57.53	31 58.867	32 26.57	31 55.189	32 25.83	31 49.244	32 37.60	31 45.944	32 18.43	31 42.622	33 20.50	31 40.444
+15.42	32 14.190	+18.92	32 13.844	+23.82	32 13.106	+27.02	32 12.709	+22.78	32 12.064	+31.36	32 11.869
+.16	− 15.32	−.24	− 18.66	+.35	− 23.86	−.12	− 26.76	−.12	− 29.44	+.04	− 32.24
	− 15.49		− 18.83		− 24.03		− 26.93		− 29.61		− 31.41
− 3.45		−3.10		−2.36	21.81	−1.97		−1.32		−.95	
+12.13		+15.58		+21.79		+24.93		+28.34		+30.45	
+32 8.11.00		+32 10.77		+11.03	11.05	+10.87		+10.96		+10.89	
+28.40		+.16		−.24		+.35		−.12		−.12		+.04
1.45332											
0.97047											
	− 118.66		+ 31.02		− 31.38		+ 38.84		− 36.59		− 17.49		− 51.66		+ 59.22		− 35.81		− 60.09		− 100.06
E	2.04430		1.49164		1.49668		1.58928		1.56336		1.24270		1.71315		1.77247		1.55100		1.77881		2.00226
G	1.59145		1.00879		1.01380		1.16643		1.08051		0.75994		1.23030		1.28962		1.07115		1.29595		1.51741
40 2		40 3		40 2		40 2		40 2		40 2		40 2		40 2		40 2		40 2		40 2	
22.9	26.6	10.1	12.2	19.1	27.3	39.9	47.0	19.2	23.8	44.2	47.8	31.1	38.0	41.4	47.4	5.9	10.2	37.1	41.8	43.2	49.6	36.7	61.5
25.4	22.0	10.3	9.0	24.2	17.9	43.9	38.1	24.1	26.6	46.4	41.2	37.4	33.8	42.3	43.0	11.2	6.3	41.1	37.7	51.4	46.0	62.4	58.1
8.3	8.6	4	21.2	43.3	45.2	8.8	8.5.1	43.3	10.4	10.6	9.0	8.5	11.8	7.7	10.4	17.1	16.3	78.2	79.5	9.4.6	15.6	11.9.1	11.9.6
24.15	24.30	10.20	10.60	21.65	22.60	41.90	42.55	21.65	25.20	45.30	45.50	34.25	35.90	43.85	45.20	8.55	8.25	39.10	39.75	47.30	47.80	59.55	59.80
42	24.22	43	10.40	42	22.12	42	42.22	42	23.42	42	46.40	42	35.07	42	44.52	42	8.40	42	39.42	42	47.55	42	59.67
+ 9.34		− 39.03		+ 10.20		− 10.32		+ 12.78		− 12.04		− 5.75		− 17.00		42 +19.48		− 11.78		− 19.77		− 32.92
42 33.56		31.37	42	32.32		31.90	42	36.20		33.36	42	29.32		27.52		27.88		27.64	42	27.78		26.75
+75 40 14.79		16.98	40	16.03		16.45	40	12.15		14.99	40	19.03		20.83	40	20.47		20.71	40	20.57		22.60
−33 19 42		18 55	19	44	19	24	19	43	19	21	19	31	19	21	19	58	19	27	19	18	19	06
1.57805		1.57785	1.57805		1.57800		1.57805		1.57795		1.57800		1.57795		1.57810		1.57800		1.57795		1.57790	
+2944		+2934	+2256		+2256		+3938		+3938		+2107		+2107		+1999		+1999		+1996		+1996	
1.60749		1.60724	1.60081		1.60076		1.61740		1.61736		1.59907		1.59902		1.59809		1.59799		1.59791		1.59786	
+40.60		+40.48	+39.89		+39.88		+41.44		+41.43		+39.73		+39.72		+39.64		+39.63		+39.62		+39.62	
− .11		− 1.88	− .13		− .13		− .20		− .19		− .07		− .85		− .46		− .17		− .47		− 1.41	
− .17		− .22	− .24		− .26		− .31		− .31		− .32		− .29		− .38		− .42		− .45		1.30	
+ .10		+ .13	+ .10		+ .11		+ .10		+ .11		+ .10		+ .11		+ .08		+ .11		+ .11		+ .12	
+40.32		+38.55	+39.64		+39.62		+41.08		+41.04		+39.48		+39.16		+38.97		+39.19		+38.84		+37.99	
+75 40 55.11		55.53	40	55.67		56.07	40	53.23		56.03	40	58.51		59.99	40	59.44		59.90	40	59.41		59.59
40 55.32	+2 3.98	40	55.87	+2 4.15							40	59.25	+2 5.13		40	59.67	+2 4.78		40	59.50	+2 6.02	
43 1.0	+0.9	43	2.7	+1.0		43	4.9		43	4.9	43	5.7	+1.3		43	6.4	+1.4		43	6.7	+1.4	
+2 5.7	−+20.9	+2	6.8	−+22.6					+2	8.9	+2	6.4	−+25.6		+2	6.8	−+26.3		+2	7.2	−+26.6	
5.8	+1 43.98		6.9	+1 42.55						9.0		6.5	+1 41.23			6.8	+1 39.88			7.3	+1 40.82	
									+2 4.43				40.83				39.86					
75		+42 39.30		+42. 38.42					+1.2				+42 40.08				+42 34.58				+42 40.32	
									−+24.8				40.04				39.56					
									+1 40.83													
									+42 36.96													

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1876phae.proj.1481.

See back Page for 50 Cephei H.

4 Camelop.

4h 37m 36s

+56° 31' 56"

−14° 09' 08"

1876

Jan 1 … Mar 1

| | m | s | | |

1876phae.proj.14611

9 Camelop. Lo

4 41 38

+66 7 37

−23 44 49

Coeff

$\frac{d\lambda}{dt}$

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

Cos δ

Jan 21 26 31 Feb. 5 10 15 20 25 Mar 1

log cos δ 9.60704 log I 0.70725

15 cos δ tan i 9.73199 I 5.09

tang δ +2.26 +1.47

sin z −.40

1876

Jan 20 × −.06

Feb. 2 × +.09

Feb. 8 × −.03

Feb. 17 × −.03

Feb. 23 × +.01

+18.92 −.14 −2.15 +16.63 +44.01

−1.75 +22.27 +44.15

−1.54 +25.41 +44.19

−1.19 +28.52 +44.18

−.94 +30.79 +44.12

+48.96 1.68984 1.42183

−.14 +.20 −.07 −.07 +.02

−25.71 +41.61 −17.69 +1.41 −27.89 +50.89 −23.41 +50.66 −36.14

1.41010u 1.61920 1.24773u 1.76824 1.44545u 1.70663 1.36940u 1.70415 1.58138u

1.14209m 1.35119 0.97972m 1.52023 1.17744m 1.43862 1.10139m 1.43614 1.31337m

15 1 | 15 2 | 15 1 | 15 2 | 15 1 | 15 2 | 15 1 | 15 2 | 15 1 | 15 2

45.7 34.7 | 26.7 35.6 | 51.2 36.8 | 24.3 29.8 | 37.8 42.8 | 24.6 31.7 | 39.7 46.2 | 20.7 26.8 | 44.0 49.5 | 32.4 35.4

52.5 46.4 | 32.2 26.2 | 36.1 48.8 | 28.6 21.2 | 42.4 31.9 | 29.9 27.2 | 48.8 41.6 | 28.3 22.7 | 54.1 44.6 | 36.8 32.2

98.2 101.1 | 58.9 61.8 | 73 105.6 | 52.9 51.0 | 80.2 80.7 | 54.5 58.9 | 88.5 87.8 | 51.0 49.5 | 98.1 85.7 | 69.2 67.6

49.10 50.55 | 29.45 30.90 | 36.65 52.80 | 26.45 25.50 | 40.10 40.35 | 27.25 29.45 | 44.25 43.90 | 25.50 24.75 | 47.05 47.05 | 34.60 33.80

16 49.82 | 17 30.17 | 16 53.22 | 17 25.97 | 16 40.22 | 17 28.35 | 16 44.07 | 17 24.62 | 16 47.30 | 17 34.20

+ 26.41 | − 13.87 | + 22.45 | − 9.54 | + 33.13 | − 15.05 | + 27.46 | − 12.63 | + 27.30 | − 20.58

17 16.23 | 16.50 | 17 15.67 | 16.43 | 17 13.35 | 13.30 | 17 11.53 | 11.99 | 17 14.60 | 13.62

+66 5 32.12 | 32.08 31.75 | 5 32.68 | 31.92 | 5 35.00 | 35.05 | 5 36.82 | 36.36 | 5 33.75 | 34.73

−23 45 16 | 44 36 | 45 13 | 44 40 | 45 26 | 44 38 | 45 22 | 44 41 | 45 19 | 44 32

1.40880 | 1.40355 | 1.40375 | 1.40360 | 1.40380 | 1.40355 | 1.40380 | 1.40360 | 1.40380 | 1.40350

+2280 | +22.80 | +3950 | +3950 | +2107 | +2107 | +2028 | +2028 | +4040 | +4040

1.42660 | 1.42635 | 1.44325 | 1.44310 | 1.42487 | 1.42462 | 1.42408 | 1.42388 | 1.44420 | 1.44390

+26.71 | +26.69 | +27.75 | +27.74 | +26.60 | +26.58 | +26.53 | +26.54 | +27.81 | +27.79

− .49 | − .13 | − .35 | − .06 | − .76 | − .15 | − .52 | − .11 | − .52 | − .29

− .16 | − .23 | − .21 | − .26 | − .20 | − .30 | − .24 | − .34 | − .27 | − .39

+ .07 | + .10 | + .08 | + .10 | + .07 | + .10 | + .07 | + .10 | + .04 | + .16

+ 26.13 | + 26.43 | + 27.27 | + 27.57 | + 25.71 | +26.23 | +25.86 | +26.19 | +27.09 | +27.21

+66 5 58.25 | 58.48 | 5 59.55 | 59.44 | 6 0.71 | 1.28 | 6 2.68 | 2.55 | 6 0.84 | 1.94

5 58.36 +2 41.5 | 5 59.39 +2 44.3 | 6 0.90 +2 51.3 | 6 2.62 +2 47.8 | 6 1.39 +2 54.5

8 46.0 +0.7 | 8 6.6 +0.8 | 8 7.2 +0.9 | 8 8.0 +0.9 | 8 8.2 +1.0

+2 4.6 6.2 −+20.7 | +2 6.9 −+22.7 | +2 6.2 −+23.3 | +2 5.3 −+24.0 | +2 6.8 −+24.3

5.9 +1 44.15 | 6.8 +1 42.53 | 5.9 +1 42.73 | 5.0 +1 41.68 | 6.5 +1 42.15

66 +7 42.51 | +7 42.22 | +7 43.72 | +7 44.30 | +7 43.54

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ι Aurigae

h m s
4 48 51
+32° 37′ 57″
+9 24 51

α_0 — m s 48 55.192
Corr α — +.04
$\frac{d\alpha}{dt}$ — +3.8979
δ_0 — 58 3.24
Corr δ — .00
$\frac{d\delta}{dt}$ — +6.109

1876 × +.09 Feb. 2 | × −.03 Feb. 8 | × Feb. 16 | +.00 × −.03 Feb. 17 | × +.01 Feb. 23 | × −.08 Mar. 14

log cos δ 9.92376
15 Corstani 0.04871
tang δ + 0.65 +1.19
sin z + .16

log t 9.39053
I 246

Jan	m	s	m	s																
21	48	56.42	4	58	16.5	2														
26		56.38	6		16.7	2	log cos δ	9.92376					log t	9.39053		
31		56.33	6		16.9	2										
Feb 5		56.27	7		17.1	1	15 Corstani	0.04871								
10		56.20	9		17.2	1								I	246	
15		56.11	9		17.3	0										
20		56.02	9		17.3	0	tang δ	+ 0.65	+1.19							
25		55.93	9		17.3	0										
Mar 1		55.84	9		17.2	1	sin z	+ .16								
6		55.75	10		17.1	1										
11		55.65	9		17.0	2										
16		55.56	10		16.8	2										
21		55.46			16.6											

m	s	m	s																		
48	2.4	48	17.7	47	56.6	48	14.4	47	58.0	48	11.8	48	31.6	48	—	47	56.3	48	9.6	47	42.6	47	37.6
	4.6		20.2		58.7		16.9		60		14.2		33.5		—		59.4		12.0		44.5		1.1
	7.3		22.5		1.0		19.4		2.0		16.9		35.8		—		1.6		14.4		46.6		3.5
			27.5				24.4				21.7				—				17.2				8.4
			29.8				26.7				24.0			26.26	23.8				21.9				10.8
48	53.7		32.5	48	52.3		29.1	48	52.0		26.4	48	39.2	.30	26.3	48	43.5		24.4				13.4
	56.0		35.0		54.9		31.7		54.5		29.0		14	.34	28.8		45.4		26.6				15.8
	58.3		37.4		57.5		34.2		56.5		31.3		39	.38	31.3		48.2		29.1				18.2
			42.3				39.1				36.3			.36	36.2				33.9				23.1
			44.7				41.6				38.5			.20	38.5				36.6				25.4
			47.3				44.0				41.1			.24	41.0				39.1				28.1
			3569				3215				2907								2667				2066
48	47.7			47	58.77			47	0.00			48	33.63			47	59.10			47	44.57		14.66
48	54.00	48	32.445	48	54.57	48	29.227	48	54.33	48	26.427	49	1.50	48	26.297	48	45.70	48	24.245			48	13.327

	+23.83	48	56.303		+27.02	48	56.225		+29.65	48	56.088		+29.77	48	56.070		+31.71	48	55.962		+42.31	48	55.592
	+.06		−23.86		−.02		−27.00		+.00		−29.66		−.02		−29.77		+.01		−33.72		−.05		−42.26
			−23.90				−27.04				−29.70				−29.81				−31.76				−42.30
	−1.11				−1.03				−.90				−.88				−.77				−.40		
	+22.78				+25.97				+28.75				+28.87				+30.95				+41.86		
+48	55.22				+55.20				+55.18				+55.17				+55.19				+55.19		

	+27.67		+.06		−.02				+.00				−.02						+.01		−.05		
	1.442101																						
	1.490772																						
			−23.56		+20.46		−25.34		+26.43		−27.90		−7.33		−35.20		+25.14		−21.46		+28.76		
ε	F		1.372188		1.31091		1.40381		1.42210		1.44560		0.56510		1.54654		1.40037		1.33163		1.46879		
ε	K		1.42089		1.35962		1.45252		1.47081		1.49431		0.91381		1.59525		1.44968		1.38034		1.50750		
					1.48873																		
					1.58244																		
′	′																						
25	0	25	1	25	0	25	1	25	0	25	1	25	1	25	2	25	0	25	1	25	0		
″	″																						
51.9	54.8	49.1	30.7	48.9	51.7	50.6	54.9	50.8	36.2	52.4	38.1	28.5	33.0	03	4.6	51.8	36.1	44.0	46.4	52.0	64.5		
56.8	51.9	51.3	44.7	53.5	52.9	54.5	55.1	58.2	52.5	58.4	57.3	36.3	34.5	68	5.2	59.6	52.7	44.6	48.9	58.3	59.2		
87	67	100.4	100.4	102.4	46	51	100	90	7	108	15.4	64.8	78	71	9.8	114	138	136	163	103	137		
54.35	53.35	50.20	50.20	51.20	32.30	52.55	53.80	54.50	56.35	55.40	57.70	32.40	33.90	355	4.90	55.70	56.90	46.80	47.65	55.15	56.85		
															4.22								
′	″	′	″	′	″	′	″	′	″	′	″	′	″	27	42.25	25	56.30	26	47.22	25	56.00		
25	53.88	26	50.20	25	51.75	26	53.77	25	55.42	26	56.55	26	33.15										
					34.38																		
+	30.95	—	26.36	+	28.38	—	28.35	+	29.57	—	31.21	—	8.20	—	39.38	+	28.12	—	24.01	+	32.17		
26	24.80		23.84	26	25.83		25.42	26	24.99		25.34	26	24.95		24.84	26	24.42		23.21	26	28.17		
+32	56 23.55		24.51	56	22.62		22.93	56	23.34		23.01	56	23.40		23.61	56	23.93		25.14	56	20.18		

+49	23	48	24	44	23	46	24	48	23	49	24	51	24	27	24	68	23	50	24	41	23	50	
	0.97905		0.97975		0.97905		0.97985		0.97905		0.97985		0.97960		0.98000		0.97905		0.97975		0.97905		
	+3960		+3960		+2107		+2107		+1206		+1206		+2039		+2039		+4060		+4060		+2600		
	1.01865		1.01935		1.00012		1.00092		0.99111		0.99191		0.99999		1.00039		1.01965		1.02035		1.00505		
	−10.44		−10.46		−10.00		−10.02		−9.80		−9.82		−10.00		−10.01		−10.46		−10.48		−10.12		
	− .19		− .13		− .23		− .16		− .17		− .20		− .01		− .31		− .16		− .11		− .21		
	− .10		− .20		− .10		− .23		− .12		− .25		− .22		− .29		− .14		− .27		− .16		
	+ .04		+ .07		+ .03		+ .08		+ .04		+ .08		+ .06		+ .08		+ .04		+ .07		+ .04		
	−10.60		−10.72		−10.30		−10.33		−10.05		−10.19		−10.17		−10.53		−10.72		−10.79		−10.45		
+32	56 12.86		13.79	56	12.22		12.60	56	13.31		12.82	56	13.23		12.98	56	13.21		14.35	56	09.73		
	56 13.32	+2	4.43	56	12.41	+2	5.13	56	13.07	+2	4.94	56	13.10	+2	4.78	56	13.78	+2	5.45			+2	7.84
	58′ 17.0		−0.4	58	17.2		−0.4	58	17.3		−0.4	58	17.3		−0.4	58	17.3		−0.4	58	16.8		−0.4
	+2 3.7		−+13.8	+2	4.8		−+14.0	+2	4.2		−+14.1	+2	4.2		−+14.1	+2	3.5		−+14.0	+2	7.2		−+13.7
	3.7	+1	50.23		4.8	+1	50.73		4.2	+1	50.44		4.2	+1	50.28		3.5	+1	51.05		7.2	+1	53.74
	32		+58 3.55				+58 3.14				+58 3.51				+58 3.38				+58 4.83				+58 3.47

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10 Camelopa.

4h 52m 18s

+60° 15' 23"

−17° 52' 35"

α_0 52m 23.13s

Corr 2 − .03

$\frac{d\alpha}{dt}$ + 5.3125

δ_0 15' 28.44"

Corr' + .2

$\frac{d\delta}{dt}$ + 5.823

Jan 21, 26, 31; Feb 5, 10, 15, 20, 25; Mar 1

52m 25.64s 25.54 25.42 25.29 25.15 25.00 24.84 24.67 24.49

10 12 13 14 15 16 17 18

15' 47.7" 48.5 49.2 49.8 50.3 50.7 51.0 51.1 51.2

8 7 6 5 4 3 1 1

log cos δ 9.69567

15 cos δ tan i 9.82062

tang δ + 1.75 + 2.02

sin z − .31

Log I

I 4.16

1876

+ Feb. 2 +.09

51 7.8	57 58.0	25.25	
11.7	33.2	1.23	
14.9	57.2	51 13.89	
	52.3		
	1.3		
	3.5		
	5.6		
	7.6		
	9.8		
51 11.47			

+23.83 +1.65 +22.34 +52 23.73

52 25362 − 23.97 − 23.94

+.16

+4992 1.69827 1.51889

5 3

50.1 53.0 54.7 41.0 48 10.00 52.40 50.00

8 51.20 + 33.03 9 24.23

+60 13 24.12

−17 53 15 1.26910 +3990 1.30886 +20.36 − .59 − .42 + .15

+ 19.50

+60 13 43.62

15' 49".5 +2 5.9 6.1

+2 443 +0.6 −+21.1 +1 43.93

+15 27.55

+ Feb. 17 −.03

51 5.7	51 46.8	37.65	
10.2	49.0	49.65	
18.3	51.0	51 35.56	
	53.1	167	
	55.2		
	57.3		
	59.3		
	1.3		
	3.5		
51 9.73			

+29.77 −.05 −29.46 −29.73

+15.44 1.65444 1.47806

5 3

46.9 55.4 102.3 51.15

5 16 4.76 9.92 4.60

8 50.37 + 30.04 9 20.84

13 28.01

53 16 1.26915 +2055 1.28970 +19.49 − .49 − .53 + .15

+ 18.62

13 46.63

15' 50.8 +2 4.2 4.4

+2 478 +0.8 −+22.4 +1 43.18

+15 29.87

+ Feb. 23 +.01

51 12.9	—		
21.2	—		
29.8	—		
	5 mid. mics		
	47.80	44.8	
	.73	48.9	
	.98	52.8	
	.62	56.1	
	.66	1.3	
51 9.97			

51 44.58 51 52.98

+31.71 +.02 −40.04 31.72

−1.02 +30.71 +23.69

−.05

+28.01 1.44731 1.26793

5 4

2.4 9.9 12.3 6.15

52 29 9.1 4.65

9 53.50 + 18.53 9 23.88

13 24.47

53 01 1.26902 +4090 1.30990 +20.41 − .18 − .44 + 1.20

+ 19.81

13 44.28

15' 57.1 +2 6.8 7.0

+2 545 +0.8 −+22.7 +1 43.55

+15 27.83

60

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ε Aurigae

α 4 53 0
δ +43° 38' 9"
ζ −1° 15' 21"

1876

Corr α: +.09 | +4.2914 | 38 14.90 | −.1 | +5.771
Corr δ: −.06 | −.03 | +.00 | −.08

	Jan 20 +	Feb 8 +	Feb 16 +	Mar 14 +
	52 9.4	52 6.3	52 21.5	52 5.6
	11.9	8.3	24.3	8.3
	14.0	10.4	27.2	10.5
			32.9	
			35.7	
	53 0.3		38.6	
	3.1		41.4	
	5.9		44.3	
			50.0	
			52.8	
			55.6	
	52 11.77	52 8.33	52 38.573	52 8.13
	53 3.10			
	+18.73	+27.02	+29.65	+42.31
	−.06	−.03	+.00	−.08
	−1.42	−1.16	−1.01	−.41
	+17.45	+25.83	+28.64	+41.82
	+53 4.43	+ 4.40	+ 4.43	+ 4.41
	+35.21	−.06	−.04	+.00
	1.54667			
	1.53122			
		−16.12	+30.24	+27.66
ε	ζ	1.20737n	1.48058	1.44185
η	Ho	1.19192n	1.46513	1.42640
		45 1	45 0	45 0
		364 415	496 538	515 564
		404 362	832 821	382 542
		768 777	1248 59	97 106
		38.40 38.85	52.40 52.95	54.85 55.30
		' "	' "	' "
		46 38.62	45 52.67	45 55.07
		− 15.56	+ 29.18	+ 26.69
		23.06	46 21.85	46 21.76
+43		25.29	36 26.50	36 26.59
−1		15 27	16 13	16 11
		0.10580	0.10610	0.10605
		+2285	+2107	+2106
		0.12865	0.12717	0.11811
		+1.33	+1.34	+1.31
		− .07	− .25	− .20
		− .14	− .11	− .12
		+ .06	+ .04	+ .04
		+1.18	+1.02	+1.03
+43		26.47	36 27.52	36 27.62
		+2 4.15	+2 5.13	+2 4.94
		+0.2	+0.0	+0.1
		−+15.6	−+17.1	−+17.5
		+1 48.75	+1 48.03	+1 47.54
43		+38 15.29	+38 15.55	+38 15.16

	Jan 21	Jan 26	Jan 31	Feb 5	Feb 10	Feb 15	Feb 20	Feb 25	Mar 1	Mar 6	Mar 11	Mar 16	Mar 21
m	53	53	53	53	53	53	53	53	53	53	53	53	53
s	5.73	5.68	5.61	5.53	5.45	5.35	5.25	5.14	5.03	4.92	4.80	4.69	4.57
'	5	7	8	8	10	10	11	11	11	12	11	12	
"	38.6	31.1	31.5	31.8	32.1	32.3	32.5	32.6	32.6	32.5	32.4	32.2	31.9
	6	5	4	3	3	2	2	1	0	1	1	2	3

log cos δ 9.85960
15 cos Stani 9.98455

tang δ +0.95 +1.38
sin z −.02

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ζ Aurigae

α_0 4h 53m 45s

Cons +40° 53' 27"

$\frac{d\alpha}{dt}$ + 1° 29' 21"

δ_0

Cons

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

1876

	Jan		Feb		Mar	
53	48.725	21	53	50.10	6	52 48.0 4
		26		50.04	6	48.4 4
		31		49.98	7	48.8 3
		Feb. 5		49.91	8	49.1 2
		10		49.83	9	49.3 2
		15		49.74	9	49.5 1
		20		49.65	10	49.6 1
		25		49.55	11	49.7 0
		Mar 1		49.44		49.7

log cos δ	9.887844
15 cos δ sin t	0.00339
tang δ	+ 0.87 + 1.32
sin z	+ 0.03

I 273

	Jan 21	26	31	Feb. 5	10	15	20	25	Mar 1
Cons	+ .05								
$\frac{d\alpha}{dt}$	+ 4.1820								
δ_0	53 32.72								
Cons	+ .1								
$\frac{d\delta}{dt}$	+ 5.703								

	Feb. 2	Feb. 8	Feb. 17	Feb. 23
	+.09	−.03	+.03	+.01
	52 54.1	53 14.3	53 [66]	52 57.3	53 3.7	52 52.8	53 1.7
	56.6	17.0	9.3	53.1	6.3	55.4	4.6
	58.4	19.3	12.0	55.6	9.1	57.9	7.4
			17.3		14.5		12.8
			20.2		17.3		15.3
	53 58.5	53 44.9	22.9	53 42.0	20.0	53 38.4	18.1
	58.7	47.5	25.7	44.4	22.7	40.9	20.8
	58.5	49.9	28.4	47.2	25.4	43.8	23.6
			33.9		30.8		28.9
			36.5		33.6		31.6
			39.3		86.4		34.6
	2870		2521		2198		1994
	52 56.47	53 16.87		52 53.33		52 55.37	
	53 55.90	53 47.43	53 22.918	53 44.53	53 19.982	53 41.03	53 18.127
	+23.83	+27.02	53 49.858	+29.77	53 49.780	+31.71	53 49.585
	+.08	−.03	− 26.94	−.03	− 29.72	+.01	− 31.46
			− 26.99		− 29.77		− 31.51
	−1.22	−1.13		−.97		−.86	
	+22.69	+25.86		+28.77		+30.86	
	+53 48.78	+48.78		+48.75		+48.99	
	+29.62	+.08	−.03		−.03		+.01
	1.47159						
	1.47498						
		−29.81	+6.05	−24.51	+26.65	−24.55	+22.76	−22.90
ε	h	1.47436	0.78176	1.36934	1.42570	1.39005	1.35717	1.35942
ζ	h	1.47775	0.78515	1.39273	1.42909	1.39344	1.36056	1.36323
		30 0	30 1	30 0	30 1	30 0	30 1	30 0	30 1
		29.9 32.4	30.7 32.7	53.2 58.1	23.7 28.2	30.4 35.6	22.3 26.2	36.9 39.5	23.6 25.7
		36.2 31.1	32.3 31.2	58.5 56.9	28.6 27.7	35.5 35.5	30.0 26.4	44.6 40.8	29.6 27.2
		661 35	540 39	117 150	123 159	89 11	523 6	815 803	132 129
		33.05 31.75	32.82 31.95	56.85 57.50	26.15 27.95	34.45 35.55	26.15 26.30	40.75 40.15	26.60 26.45
		30 32.40	31 31.97	30 56.67	31 27.05	30 35.00	31 26.22	30 40.45	31 26.52
		+ 29.85	− 30.04	+ 6.10	− 24.70	+ 26.86	− 24.74	+ 22.94	− 23.08
		31 2.25	2.18	31 2.77	2.35	31 1.86	1.48	31 3.39	3.44
+40	51 46.10		46.17	51 45.58	46.00	51 46.49	46.87	51 44.96	44.91
+1	28 26	29 26	28 61	29 21	28 29	29 26	28 34	29 21
	0.17035	0.17543	0.17250	0.17495	0.17105	0.17495	0.17125	0.17495
	+3978	+3978	+2107	+2107	+2053	+2053	+4090	+4090
	0.21029	0.21519	0.19357	0.19602	0.19160	0.19550	0.21240	0.21585
	−1.62	−1.64	−1.56	−1.57	−1.56	−1.57	−1.63	−1.64
	−.23	−.23	−.02	−.16	−.19	−.16	−.13	−.14
	−.06	−.16	−.11	−.17	−.08	−.20	−.10	−.21
	+.02	+.06	+.04	+.06	+.02	+.06	+.03	+.06
	−1.89	−1.97	−1.65	−1.84	−1.81	−1.87	−1.83	−1.93
+40	51 44.21	44.20	51 43.93	44.16	51 44.68	45.00	51 43.13	42.98
	51 44.20	+2 4.43	51 44.04	+2 5.13	51 44.84	+2 4.78	51 43.06	+2 5.45
	53' 48.9	−0.2	58 49.2	−0.1	58 49.5	−0.1	58 49.7	−0.1
	+2 4.7	−+16.0	+2 5.2	−+16.3	+2 4.7	−+16.6	+2 6.6	−+16.8
	4.8	+1 48.23	5.3	+1 48.73	4.8	+1 48.08	6.7	+1 48.55
40		+53 32.43		+53 32.77		+53 32.92		+53 31.61

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Aurigae

α 4 57 45
δ +41 3 47"
+1 19 1

α_0 57 49.25
Corr$^{\alpha}$ + .04
$\frac{d\alpha}{dt}$ + 4.1972
δ_0 3 52.48
Corr$^{\delta}$ − .5
$\frac{d\delta}{dt}$ + 5.322

1876

Jan. 21, 26, 31; Feb. 5, 10, 15, 20, 25; Mar. 1, 6, 11, 16, 21

57 5066, 5061, 5055, 50.48, 50.41, 50.31, 50.22, 50.12, 5001, 49.91, 4980, 49.69, 4958
5 6 7 8 9 9 10 11 10 11 11 11
4 4 4 3 3 2 2 1 0 1 2 2

7.4 7.8 8.2 8.5 8.8 9.0 9.2 9.3 9.3 9.2 9.1 8.9 8.7

log cosδ 9.89734
15 corr$^{\delta}$ tanι 0.00229
tangδ + 0.87 + 1.32
sin z + .02

I 2.74

Jan. 20		Jan. 31		Feb. 2		Feb. 8		Feb. 17		Mar. 14	
−.06		+.01		+.09		−.03		−.03		−.08	
57 24	57 15.4	57 29.7	57 [11.0]	57 0.7	57 10.1	56 49.4	57 7.1	56 48.8	57 4.1	56 32.7	56 57.1
5.1	18.0	33.9	18.7	3.6	18.0	57.9	9.6	57.3	7.0	35.2	33.9
7.6	20.9	37.2	16.4	5.6	15.7	57.2	12.5	53.5	9.7	37.3	36.6
	26.3		22.0		21.1		17.8		15.2		45.7
	29.0		24.8		23.8		20.6		17.8		2.0
57 37.1	31.7		27.6		26.7	5	23.4		20.5		4.7
53.3	34.5		30.4		29.4		26.1		23.3		7.5
56.0	37.3		33.1		32.1		28.9		26.1		10.3
	42.8		38.5		37.6		34.3		31.6		13.0
	45.6		41.2		40.4		37.1		34.3		18.5
	48.3		43.9		43.1		39.8		37.1		21.2
											24.0
	34.98		30.26		29.30		25.72		22.67		26.28
57 5.03		57 33.60		57 3.30		56 51.83		56 51.20		56 35.07	8.28
57 53.47	57 31.800		57 27.509		57 26.636		57 23.382		57 20.604		57 7.527
+18.93	57 50.668	+23.19	57 50.546	+23.83	57 50.518	+27.02	57 50.428	+29.77	57 50.270	+42.31	57 49.728
−.05	− 1887	+.01	− 2304	+.08	− 2388	−.03	− 2705	−.03	− 2966	−.07	− 4220
	− 1891		− 2308		− 2392		− 2709		− 2970		− 4224
−1.41		−1.29		−1.26		−1.17		−1.01		−.47	
+17.47		~~+21.71~~	21.91	+22.65		+25.82		~~+28.74~~	2873	+41.77	
+47.27		~~+49.22~~	49.42	+49.29		+49.20		~~+49.35~~	4934	+47.30	
+26.77		−.05		+.01		+.08		−.03		−.03	−.07
1.42765											
1.42994		1.63									
	− 2.88		− 6.04		+ 23.34		+ 31.55		+ 29.41		+ 32.46
E F	1.33506		0.78462		1.36810		1.49900		1.46850		1.57135
G K	1.33735		0.78691		1.37039		1.50129		1.47079		1.51364
20 0		20 1		20 0		20 0		20 0		20 0	
13.9 20.5		3.2 9.1		49.1 50.7		18.0 21.2		8.3 13.8		9.5 14.5	
20.8 16.3		8.1 5.0		35.9 30.9		24.8 17.8		15.9 11.5		17.0 14.0	
34.7 36.8		11.3 14.1		10.50 16		42.8 39.0		24.2 5.3		2.14 5	
17.35 18.40		5.65 7.05		32.50 50.80		21.40 19.50		12.10 12.65		13.70 14.25	
' "		' "		' "		' "		' "		' "	
20 17.87		21 6.35		20 51.65		20 20.45		20 12.37		20 13.97	
+ 26.91		− 21.75		− 6.12		+ 23.46		+ 31.72		+ 29.56		+ 32.63
20 44.78		44.60		20 45.53		20 43.91		20 44.09		20 43.53	
+41 2 3.57		3.75		2 2.82		2 4.44		2 4.24		2 4.82	
H 18 12		19 00		18 46		18 14		18 06		18 08	
0.11740		0.12180		0.12042		0.11740		0.11680		0.11680	
+2287		+3191				+3980		+2107		+2063	
0.14027		0.14467		0.16261		0.15720		0.13787		0.13743	
−1.38		−1.40		−1.42		−1.44		−1.37		−1.37	
− .19		− .12		− .02		− .14		− .27		− .23	
− .03		− .10		− .08		− .03		− .02		− .03	
+ .01		+ .04		+ .03		+ .01		+ .01		+ .01	
−1.59		−1.58		−1.49		−1.60		−1.65		−1.62	
+41 2 1.98		2.17	2 1.33		2 2.84		2 2.61		2 3.20		
2 2.08	+2 4.15			+2 4.19		+2 4.43		+2 5.13		+2 4.78	+2 7.84
4 7.3	−0.1	4	8.2	−0.1	4 8.3	−0.1	4 8.7	−0.1	4 9.1	−0.1	−0.1
+2 5.2	−+14.8	+2	6.9	−15.7	+2 5.5	−+15.8	+2 6.1	−+16.2	+2 5.9	−+16.6	
4.7	+1 49.25		6.4	+1 48.39	5.0	+1 48.53	5.6	+1 48.83	5.4	+1 48.08	
41	+3 51.33			+3 49.72		+3 51.37		+3 51.44		+3 51.28	

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λ Eridani

α_0 2h 3m 5s

Conv

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

δ_0 −8° 54′ 58″

Cond

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

+51° 17′ 46″

1876

| | m | s | | |

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Aurigae

5 7 27
+45 52 5
−3 29 17

α_0 7 31.876
Corr − .02
$\frac{d\alpha}{dt}$ + 4.4238
δ_0 52 9.39
Corr + .1
$\frac{d\delta}{dt}$ + 4.131

log cos δ 9.84282
15 cos δ tan i 9.96777 Jan 5 6 Mar.
9.96475 July 10. 12. 18. 19
9.96798 July 26
tan δ + 1.03 + 1.44
sin Z − .06

log I 84 7.147
log A+2 1.42259
2.70
I' .179
A+2. 26.461

1876

	Jan. 20	Jan. 26	Jan. 31	Feb. 2
	−.06	+.02	+.01	+.09
	6 35.6	6 42.2	6 54.4	6 38.3	6 31.8	6 37.7	6 52.3	6 37.5	6 37.1	6 57.7
	38.0	45.1	57.3	38.6	33.9	40.7	33.3	40.3	40.0	57.7
	40.8	48.1	0.4	40.9	36.1	43.6	38.3	42.4	42.9	57.6
		51.0	6.2			46.6	43.2		45.9	34
		54.0	9.4			49.5	43.620 7.2		48.7	42.960 6.4
		−14.56 5.8	12.3	7 48.0		31.1	10.1		30.0	9.4
		−.57 59.7	15.2	53.0		34.0	13.3		33.2	12.3
		−.44 2.6	17.9	53.1		37.0	16.2		36.2	15.3
		−.62 8.7	23.7			40.0	22.0		39.1	21.0
		−.46 11.5	27.0			43.0	37.020 25.0		42.0	36.100 24.2
		−.50 14.5	30.0				28.0			27.2
	6 48.080									
	+26.461									
	34.42		25.38		40.32		29.19		39.53	28.32
6 38.13	63.42	6 37.60	13.38	6 33.93	70.32		11.14	6 40.07	69.53	10.32
	7 14.541	6 57.635	7 12.164	7 52.03	7 10.320	7 10.173			7 9.530	7 9.382
		~~7 14.525~~				.141				.351
		~~7 14.533~~	7 12.164			7 10.157				7 9366
	+18.93	7 33.469		+21.20	+23.19	7 33.334			+23.83	7 33.304
	−.06	~~− 35.81~~ −18.94	7 33.397	+.02	+.01	− 23.18			+.09	− 23.94
		~~− 35.74~~ −18.92	− 21.21			− 23.16				− 23.92
	− 1.59		−1.52		−1.46				−1.43	
	+17.28		+19.70		+21.74				+22.49	
	+7 31.81		+31.86		+31.90				+31.86	
		−.06		+.02		+.01				+.09

E	F	+36.40		+34.56		+36.23	−41.87		+29.30	
		1.56110		1.53857		1.55907	1.62190n		1.46687	
G	H	1.52887		1.50634		1.52684	1.58467n		1.43464	
		'		'		'	'		'	
		30 1		30 1		30 1	30 3		30 2	
		"		"		"	"		"	
		53.1 0.4		57.0 59.2		53.5 57.4	5.3 7.8		0.6 4.1	
		59.6 54.7		0.9 57.3		59.9 54.1	10.8 6.4		6.5 59.3	
		12.7 11.5 1		11.9 16.5		13.7 11.5	16.1 14.2		7.1 12.34	
		56.35 57.55		58.95 58.25		56.85 55.75	8.05 7.10		3.55 1.70	
		' "		' "		' "	' "		' "	
		31 56.95		31 58.60		31 56.30	33 7.57		32 2.62	
		+ 33.80		+ 32.09		+ 33.64	− 38.87		+ 27.20	
		32 30.75		32 30.69		32 29.94	28.70		32 29.82	
+45	50 17.60		50 17.66		50 18.41	19.65		50 18.53		
	30 09		30 07		30 10	28 58		30 03		
	0.54700		0.54700		0.54720	0.54470		0.54680		
	+2289		+3783		+3196	+3196		+3994		
	0.54989		0.55483		0.57916	0.57666		0.58674		
	+3.71		+3.84		+3.80	+3.77		+3.86		
	− .36		− .33		− .35	− .47		− .24		
	− .17		− 20		− .21	− .34		− .22		
	+ .08		+ .08		+ .08	+ .12		+ .08		
	+ 3.26		+ 3.39		+ 3.32	+ 3.08		+ 3.48		
+45	50 20.86		50 21.05		50 21.73	22.73		50 22.01		
		+2 4.15		+2 4.74	50 22.23	+2 4.19			+2 4.43	
	52 25.0	+0.1	52 26.6	+0.0	52 26.1	+0.0		52 26.3	+0.0	
	+2 4.1	−+15.6	+2 4.5	−+16.2	+2 3.9	−+16.7		+2 4.3	−+16.9	
	4.2	+1 48.65	4.6	+1 48.54	4.0	+1 47.49		4.4	+1 47.53	
45		+52 9.51		+52 9.59		+52 ~~9.22~~ 9.72			+52 9.54	

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	m	s	′	″
Jan 21	7	33.46	6 52	25.1 5
26		33.40	6	25.6 5
31		33.34	6	26.1 5
Feb 5		33.26	8	26.5 4
10		33.18	8	26.9 4
15		33.08	10	27.2 3
20		32.98	10	27.4 2
25		32.87	11	27.5 1
Mar 1		32.75	12	27.5 1
6		32.63	12	27.6 0
11		32.51	12	27.5 1
16		32.39	12	27.4 2
21		32.27		27.2
		−.03		−.03

Feb 8 +

| | | |

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+.01 Feb. 23 +

−.15 −.10 Mean. 1 +

−.08 Mean. 14 +

−.61 July 10 +

+31.71 +.01 −1.03 +30.69 +7 +31.85

+39.22 −.15 −.14 −.72 +38.21 +31.91

+42.31 −.08 −.55 +41.68 +31.85

−10.36 −.63 −.79 −11.78 +31.91

+.01

−.15 −.14

−.08

−.63

+30.93 1.49038 1.45815

+18.80 1.27416 1.24193

−14.20 1.15229 2 1.12006 2

+41.79 1.62107 1.58582

30 1 " " 57.6 23 6.3 12.39 1.95 + 28.72 +45 3

30 2 97 156 19.6 202 293 358 14.65 17.90 " " 32 16.27 + 17.46 32 33.73 50 14.62 29 50 0.57440 −118 0.56322 +3.51 −.10 −.39 +.69 +3.11 50 17.73

30 2 418 443 478 466 96 109 44.80 45.45 " " 32 45.12 − 13.18 32 31.94 50 16.41 29 21 0.56530 +2651 0.59181 +3.73 −.05 −.50 +.11 +3.29 50 19.70

30 2 42.1 43.7 47.3 43.9 94 16 44.70 43.80 32' 44".25 + 38.53 33 22.78 49 25.57 30 17 0.56740 −2745 0.53995 +3.81 −.47 −.51 +.11 +2.44 49 28.01

+45 +2 5.45 +0.2 52 27.5 +2 9.9 10.0

+2 8.87 +0.1 −+18.2 +1 50.77 +52 8.50

+2 7.84 +0.1 −+18.1 +1 49.84 +52 9.54

+2 46.85 +0.0 −+5.3 +2 41.55 +52 9.56

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June 29 July 1 9 14 19 24 29 Aug 3 8 13 18 23 28

	32.31	15	52	15.6	4			
	32.46	16		15.2	4			
	32.62	17		14.8	4			
	32.79	17		14.4	4			
	3296	17		14.1	3			
	33.14	18		13.9	2			
	33.33	19		13.7	2			
	33.53	20		13.5	2			
	33.73	20		13.4	1			
	33.93	20		13.3	1			
	34.14	21		13.3	0			
	34.35	21		13.3	0			
	34.57	22		13.4	1			
	-.87			-.90		-.88		-.76
	-.07					-.07		-.06

See Sup. List for continuation p.36

July 12 × July 18 × July 19 × July 26

7	12.6	7	13.6	7	28.1	7	9.7	7	20.5	7	35.2	7	7.1	7	21.6	7	36.3	7	21.4	7	28.7	7	43.5
	15.0		16.6		31.1		11.7		23.5		38.1		9.1		24.5		39.2		23.4		31.8		46.4
	18.0		19.5		84.0		14.4		26.4		41.0		11.3		27.6		42.2		26.2		34.7		49.4
			22.4		40.2				29.3		47.0				30.5		48.1				27.6		53.3
			25.3	19480	42.9				82.4	26420	52.0				83.5	27540	57.0				40.7	34700	58.3
			70		46.0				13.8		52.9				15.0		57.1				22.0		1.2
			9.7		48.7				16.7		53.7				17.8		57.0				25.0		4.2
			12.7		51.8				19.6		58.8				20.9		60				28.0		7.1
			15.4		4.76				22.4		4.8				23.8		6.0				34.0		13.1
			18.6	12740	8.7				25.6	19480	7.8				26.9	20880	8.4				33.9	27980	16.0
					3.6						10.7						12.0						19.0
			1611		3847				2305		4020				2421		3548				3134		3135
7	15.20				5047	7	11.93				5820	7	9.17				5448	7	23.67				
		7	46.110		45.882			7	53.050		52.909			7	54.210		54.073			8	1.340	8	1.227
					931						871						.031						161
				7	45906					7	52890					7	54057					8	1.194
			-12.29	1M	32730				-19.12	1M	32934				-20.11	1M	32949				-27.18	1M	33226
			-.90	+	1318				-.93	+	1496				-.91	+	21.08				-.78	+	2767
			-.10		13.20				-1.086		1998				-.10		21.10				-.09		2799
			-.85						-21.11						-1.09						-1.35		
			-14.14						+31.78						-22.21		3184				-2.940		
			+31.77												+31.82						+31.79		
					-.90						-.93						-.91						-.76
					-.10												-.10						-.09

Ee	7	+30.71				+4096				+4488				+37.52					
		1.48728				1.61236				1.65205				1.57426					
Ey	16	1.45203				1.57711				1.61680				1.54224					
	30	2				30	2			30	2			30	2				
	52.8	53.1				49.2	44.4			44.2	40.4			12.8	13.1				
	56.8	55.4				53.8	46.4			50.2	41.4			71.1	3.1				
	96	85				1030	108			944	18			30	162				
	54.80	54.25				51.50	45.40			47.20	40.90			11.95	8.10				
	32	54.52				32	48.45			32	44.05			32	10.02				
	+	28.32				+	37.77			+	41.38			+	34.85				
33	22.84					33	26.22			33	25.43			32	44.87				
+45	49	25.51				49	22.13			49	22.92					ex			
3	30	07				30	13			30	17			30	51				
	0.54700					0.54720				0.54740				0.54870					
	-.2685					-.2575				-.2871				-.2722					
	0.52015					0.52145				0.51869				-.702					
	+3.31					+3.32				+3.30				0.54148					
	-.24					-.46				-.55				+3.48					
	-.55					-.50				-.49				-.38					
	+.12					+.11				+.11				-.37					
	+2.62					+2.47				+2.37				+.09					
														+2.82					
+45	49	28.13	+2	47.10		49	24.60	+2	50.02	49	25.29	+2	49.15	+2.82		+3	7.65		
	52	14.5		+8.0		52	14.2		+0.1	52	14.1		+0.1	52	13.8		+0.1		
	+2	46.4		-+5.1		+2	49.6		-+4.8	+2	48.8		-+4.87				-+4.47		
		46.6	+2	42.00			49.7	+2	45.32		48.9	+2	44.55			$	+3	3.35	
45			+52	10				+52	9.92			+52	9.84						

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B Orionis

α 5h 8m 32s

δ 8° 20' 53"

+ 50 43 41

α_0 8m 34.758s

Corr^n − .02s

$\frac{d\alpha}{dt}$ + 2.8817s

δ_0 20° 48' 49"

Corr^n + .6"

$\frac{d\delta}{dt}$ + 4.447"

log cos^2 9.99537

15 Cos^2 tan 0.12032 Jan. Feb.
0.11730 July 12, 18, 19
0.12053 July 26
0.11773 Aug 12

tang^2 − 0.15 +1.01

sin z + .77

log R-2 1.27591

R-2 18.876

$\frac{I}{I'}$ 2.08
.126

1876

− .06

+ Jan. 20

m	s	m	s	m	s
8	10.2	7	54.3	8	4.4
			56.4		6.6
			58.5		8.6
			0.6		12.9
			2.5		14.9
9	0.3		21.8		17.0
			22.7		19.1
			24.0		21.2
			28.0		25.3
			40.0		27.5
					29.6
			35.20		18.71
8	10.20		17.20		
9	0.30	8	17.009	8	17.009
			074		
		8	17.042		
			+18.93	8	35.974
			+.01		− 18.93
					− 18.91
			− 1.282		
			+17.72		
		+8	34.76		

+ Jan. 26

m	s	m	s	m	s
7	45.2	8	2.3	8	8.8
	47.7		4.5		
	49.5		6.6		
			10.5		
8	57.5		12.6		
			14.9		
			16.8		
			18.8		
			22.7		
			25.0		
			27.1		
			16.18		
7	47.47	8.	8.80		
8	57.50		8.14.709		
			8 14.709		
			8 35.928		
			+21.20		
			+.00		
			− 21.22		
			− 21.20		
			− 1.17		
			+20.03		
		+8	34.74		

+ Feb. 2

m	s	m	s	m	s
7	49.1	7	5.94	7	5.66
	51.2		1.9		58.0
	53.3		3.7		59.7
	55.4		8.0		
	57.5		9.9		
	26.6		12.0	8	45.4
	28.7		14.0		47.2
	30.7		16.2		49.2
	32.9		20.2		
	35.0		2.24		
			24.5		
	42.04		19.22		
	12.04		13.22	7	58.10
8	12.040	8	12.018	8	47.27
			11.914		
		8	11.966		
	+23.83	8	35.858		
	−.01		− 23.89		
	− 1.10		− 23.87		
	+22.72				
	+34.69				

− .03

+ Feb. 8

m	s	m	s
7	45.9	7	5.63
	48.0		58.1
	50.1		0.4
	52.2		4.5
	54.3		6.6
	23.5		8.7
	25.5		10.8
	27.6		12.9
	29.7		17.1
	31.8		19.2
			21.3
	38.86		21.62
	8.86		9.62
8	8.860	8	6.745
			24
		8	8.440
	+27.03	8	35.491
	+.00		− 27.05
	− 1.03		− 27.03
	+26.00		
	+34.74		

+ 6.84
0.83506
0.95538

	− 43.26	× 2.734	+ 27.24	− 42.79		+ 3.17			
	1.63609 n		1.43521	1.63134 n		0.50106			
	1.75641 m		1.55353	1.75166 m		0.62138			
	,								
	40 4		—	45 0		40 4			
	"								
	12.1 12.0		—	186 142		163 112			
	18.8 14.8			174 191		129 149			
	8.9 6.8			160 133		92 61			
	12.95 13.40			18.00 16.65		1460 13.05			
	,			,		,			
	44 13.17			45 17.32		44 13.82			
	+ 9.02		+ 35.94	− 56.45		+ 4.18			
	44 22.19			44 20.87		44 18.00			
−8	21 33.84			21 32.52		21 29.65			

	+ 10.64		− 38.53						
	1.02694		1.58580 n						
	1.14726		1.70612 m						
	40 4		45 0						
	100 75		152 117						
	96 132		152 183						
	196 207		2 100						
	980 10.35		1520 15.00						
	, "		, "						
	44 10.07		45 15.10						
	+ 14.04		− 50.83						
	44 24.11		24.27						
	21 35.76		35.92						

80	42 07		43 14		43 11		42 07		
	1.84660		1.84685		1.84685		1.84660		
	+2289		+2289		+3783		+3994		
	1.84749		1.84974		1.88468		1.88454		
	−93.27		−74.09		−76.68		−77.01		
	+ .01		+ .15		+ .14		+ .00		
	− .38		− .03		− .03		− .46		
	+ .17		+ .01		+ .01		+ .17		
	− 1 14.24		− 1 13.96		− 1 16.56		− 1 17.30		
−8	22 48.08		48.69		22 49.08		22 46.95		
	22 48.38	+ 2	4.15	+ 2	4.74	+ 2	4.43		
	20' 45.6		−1.7		−1.8		−1.8		
	+2 2.8		−2.9		−2.2		−1.05		
	3.4		+ 1 59.55	+ 2	0.74	+ 2	1.13		
−8		−20	48.53	−20	48.34	−20	45.82		

	42 04		43 09						
	1.84660		1.84685						
	+2107		+2107						
	1.84767		1.84792						
	−73.74		−73.78						
	+ .01		+ .06						
	− .50		− .02						
	+ .17		+ .01						
	4.06								
	− 1 13.42		− 1 13.68						
2	39.82		49.60						
2	49.71	+ 2	5.13						
20	47.6		−1.8						
+2	2.1		−0.9						
	2.7	+ 2	2.43						
		−20	47.28						

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	m	s	'	"	
Jan 21	8	35.97	21	45.7	6
26		35.93		46.3	6
31		35.88		46.8	5
Feb. 5		35.83		47.3	5
10		35.77		47.7	4
15		35.70		48.0	3
20		35.63		48.3	3
25		35.55		48.5	2
Mar 1		35.47		48.7	2

| | | |

1876phae.proj.1481.

	m	s			″	
June 29	8	35.35	10	21	35.5	10
July 4		35.15	11		34.5	10
9		35.26	11		33.5	9
14		35.37	12		32.6	9
19		35.41	12		31.7	9
24		35.61	13		30.8	8
29		35.74	14		30.0	8
Aug 3		35.88	14		29.2	8
8		36.03	14		28.4	7
13		36.16	14		27.7	6
18		36.30	15		27.1	5
23		36.45	15		26.6	5
28		36.60			26.1	

−.06 −.87 −.07 −.90 −.88 −.07

Mar. 22 + July 12 + July 18 + July 19

Ch. J.

m	s		m	s											
8	43.8		8	35.3	8	42.9	9	31.0	8	42.0	8	44.0	8	43.1	
				37.1		45.0				44.0		45.4		45.2	
				39.3		46.6				46.2		47.3		47.3	
				43.5						48.5				47.4	
				45.5						52.4				43.5	
9	12.0			47.5						54.6	9	26.0	9	10.3	
	15.6			49.4						56.5		27.7		12.4	
	18.6			51.8						58.4		29.6		14.5	
				53.9						28.4				16.4	
				55.9						57.0				18.7	
				58.0						7.1					
				46.35						41.98				43.17	
8	43.80			52.35	8	44.83	9	31.00	8	50.98	8	45.67		61.17	
9	15.40		8	47.591					8	54.527	9	27.77		55.624	8	55.669
			8	47.558					8	54.527					8	55.616
			8	35.332					8	35.472					8	35.496
				1223						19.05						20.12
				12.25						19.07						20.14

				−12.30				−19.12				−20.12				
+.01				+.13				+.14				+.18				
				−.07				−.71				−.07				
				−.57								−.73				
				−12.81				−19.69				−20.80				
				+34.75				+34.84				+34.82				
	+.01				+.13				+.14				+.13			
					−.07								−.07			

			+3.76	−27.84			+9.70				+9.95	−32.15				
Eg	Fg		0.57519	1.44467n			0.98677				0.99782	1.50718n				
Eg	Hg		0.69249	1.56197n			1.10467				1.11512	1.62448n				
			45 0				40 4	45 0			40 4	45 0				
A.R.			346 28.5				52.9 39.1	53.4 41.8			51.1 39.9	45.2 35.4				
			35.4 37.5				51.4 49.8	52.5 50.8			49.9 48.5	46.5 43.8				
			100 660				43 889	59 926			1010 884	117 792				
			35.00 33.00				52.15 44.45	52.95 46.30			50.50 44.20	45.85 39.60				
			45′ 31.00	45 34.00			44′ 48.30	45′ 49.62			44′ 47.35	45′ 42.72				
			+ 4.93	−36.47			+ 12.71				+ 13.04	− 42.12				
			45 38.93	44 57.53			45 1.01				45 00.39	45 0.60				
−8			22 50.58	22 9.18			22 ~~22.66~~ 12.66				22 12.04	12.25				
+.50			~~42~~ ~~33~~	42 33			41 47				41 46	42 42				
				1.84670			1.846 ~~50~~				1.846 ~~80~~ 52	1.84675				
				−2685			−2575				−2871	−2871				
				1.81985			1.82075				1.81779	1.81804				
				−66.05			−66.18				−65.73	−65.77				
				+ .06			+ .01				+ .01	+ .08				
				− .11			− .86				− .86	− .12				
				+ .02			+ .19	+ .03			+ .19	+ .03				
				−106.08			−1 684				−1 639	−1 6.78				
−8			23 15.26				23 19.50				23 18.43	18.03				
					+2 47.10			+2 50.02			23 18.23	+2 49.15				
			20 32.9		− 1.4		20 31.8	− 1.5			20 31.7	− 1.5				
			+2 42.4		−+15.5		+2 47.7	−+16.7			+2 46.5	−+16.8				
			43.0		+2 30.20		48.3	+2 31.82			47.1	+2 30.85				
−8					−20 45.06			−20 47.68				−20 47.38				

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v. 8.2. p. 45

July 24 — Ch. f. — −.85

July 26 — −.76, −.06 — +.13, +.11, −.06

Aug. 6 — Ch. f. — −1.05 — +.16

Aug. 12 — −1.09 — +.16

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1 Orionis

5 11 32

6° 58 53"

49° 21' 41"

1876

α_0 11 35 20

Corr − .27 .06

$\frac{d\alpha}{dt}$ + 2.9141

δ_0 58 48.65

Corr − .2 + .0

$\frac{d\delta}{dt}$ + 4.180

+.09 −.03 +.01 −.15 −.05

Feb. 2 × Feb. 8 + Feb. 23 + Mar. 7 + Mar. 14 +

Jan.	m	s	m	s			m	s			m	s	m	s
21	11	36 42			14	58	4	55	6					
26		33 39			5			61	6					
31		36 34			5			66	4					
Feb. 5		36 29			6			70	4					
10		36 23			7			74	3					
15		36 16			7			48 7	3					
20		36 09			8			48 0	2					
25		36 01			8			48 2	2					
Mar. 1		35 93			8			48 4	1					
6		35 85			8			48 5	0					
11		35 77			9			48 5	0					
16		35 68			9			48 5	0					
21		35 59						48 5						

log cos δ 9.99677

15 cos δ tan i 0.12172

tang δ − 0.12 + 1.01

sin z + .76

10	56 9	10	59 9	10	56 2	10	56 8	10	40 8	10	52 0	10	29 7	10	44 2	10	36 8	10	40 9
	57 8		2 0		58 4		58 7		42 5		53 9		31 4		46 3		39 2		43 0
	52 3		4 1		0 5		0 7		45 6		56 0		33 6		48 4		38 2		45 1
			8 3				5 0				0 2				52 6				49 2
			1 04				7 1				2 1				5 16				57 3
11	49 7	11	12 4	11	41 0	11	9 2	11	32 9	11	4 4	11	16 0	10	56 7				53 3
	57 7		14 5		42 7		11 3		34 7		6 2		17 8		58 9				53 4
	58 1		16 6		44 1		13 3		36 8		8 4		20 0		0 4				57 5
			20 7				1 4				12 4				5 0				1 6
			22 8				19 5				14 7				7 1				3 7
			24 8				21 7				16 7				9 1				5 9
			1965				2211				2270				3836				4069
10	57 70		1365	10	58 37		1011	10	42 97		470	10	31 67		6236	10	36 40		5869
11	51 50	11	12 409	11	42 87	11	9 191	11	34 80	11	4 273	11	17 98	10	56 691			10	53 355
	+23.83	11	36318		+27.03	11	36257		+31.71	11	36038		+39.22	11	35830		+42.31	11	35712
	−.01		− 2391		+.00		− 2706		−.03		− 3176		+.02		− 3914		+.01		− 4336
			− 2385				− 2700				− 3170				− 3908				− 4230
	−1.11				−1.05				−.83				−.63				−.51		
	+22.71				+25.98				+30.88				+38.61				+41.81		
+11	35.12				+35.17				+35.15				+35.30				+35.17		
	+14.71		−.01				+.00				−.00				+.02				+.01
	1.16761																		
	1.28933																		
			−39.09		+30.82		−33.68		+31.30		−30.53		+25.02		−21.24		+16.96		
ξ	η		1.59207m		1.03423		1.52737m		1.32838		1.48473m		1.39829		1.32715m		1.22943		
φ	λ		1.71379m		1.15595		1.64909m		1.45010		1.60643m		1.52001		1.44887m		1.35115		
°	'																		
20	2	20	3	20	2	20	3	20	1	20	3	20	2	20	3	20	2		
"	"																		
31	14	15 6	11 9	13 1	12 8	13 1	10 4	5 46	5 37	3 0	2 1	0 2	5 61	2 1	5 71	9 5	—		
39	45	15 2	16 1	15 6	15 4	12 5	16 1	5 16	3 86	4 9	7 8	5 2	11 8	7 1	13 2	12 0	—		
10	5 9	8	8 0	8 7	8 2	5 6	6 5	12 2	12 3	7 9	9 9	5 4	12 79	9 2	13 03	2 15			
3 50	2.95	15 40	14.02	14.35	14.10	12 30	13.25	5 6.10	5 6.15	3 95	4 95	2 70	3.95	4 60	5.15	10.75			
'	"	'	"	'	"	'	"	'	"	'	"	'	"	'	"				
22	3.22	23	14.70	22	14.22	23	13.02	21	56.12	23	4.45	22	3.32	23	4.87				
	+ 19.47		− 51.73		+ 14.32		− 44.57		+ 28.19		− 40.41		+ 33.12		− 28.11		+ 22.45		
22	22.60		22 97	22	28.54		28.45	22	24.31		24.04	22	36.44		36.76				
−6 0	25.66		25.38	0	19.81		19.90	0	24.04		−24.34	0	11.91		−11.59				
59	34.34	21	34.62	59	40.19		40.10	59	35.96		35.69	59	48.09		48.41				
47 19	57	20	09	20	08	21	07	19	50	20	58	19	67	20	59				
	1.82560		1.82585		1.82560		1.82585		1.82555		1.82580		1.82560		1.82580				
	+4004		+4004		+2107		+2107		+4174		+4174		−89		−89				
	1.86564		1.86589		1.84667		1.84692		1.84729		1.86754		1.82471		1.82491				
	−73.39		−73.43		−70.25		−70.29		−73.67		−73.71		−66.79		−66.82				
	+ .01		+ .10		+ .01		+ .07		+ .03		+ .06		+ .04		+ .03				
	− .23		− .35		− .26		− .38		− .28		− .47		− .36		− .53				
	+ .08		+ .13		+ .09		+ .13		+ .08		+ .12		+ .08		+ .12				
	−113.53		−113.55		−110.41		−110.47		−113.84		−114.00		−107.03		−107.20				
−6 0	47.87		48.17	0	50.60		50.67	0	49.80		49.69	0	55.12		55.61				
0	48.02	+2	44.43	0	50.58	+2	5.13	0	49.74	+2	5.45	0	55.37	+2	8.87			+2	7.84
58	46.8		−1.7	58	47.3		−1.8	58	48.1		−1.9	58	48.5		−1.9				−1.9
+2	1.2		−1.8	+2	3.3		−1.3	+2	1.6		−0.5	+2	6.9		−0.1				
	1.2	+2	0.93		3.3	+2	2.03		1.6	+2	3.05		6.5	+2	6.87				
−6		−58	47.19			−58	48.55			−58	46.69			−58	48.50				
			4709																

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β Tauri

5h 18m 23s

+28° 29' 37"

+13 52 51

α_0 m 18 27.249 s

Corr^n − .81

$\frac{d\alpha}{dt}$ + 3.7891

δ_0 30 0.77

Corr^n + 1.1

$\frac{d\delta}{dt}$ + 3.4421

log cos δ 9.94390

15 cos Stan 006885 Jan. Feb. Mar

0.06583 July 10, 12, 18, 19

0.06586 July 26 + 31

tang δ + 0.54 + 1.14

sin z + .24

log I 0.37039

log R+2 1.32157

log R−2 1.32738

I 2.35

R+2 20.966

R−2 21.251

I' .142

1876

	Jan. 20		Jan. 26		Jan 27		Feb. 2	
	−.06		+.02		−.02		1.09	
	+		+		+		+	
	18 10.3	18 7 556	17 59.4	17 53.3	17 56.5	17 32.4	18 2.0	17 —	17 50.5
	13.2	58.0	1.5	55.7	3.8	68 33.2	3.6	—	52.9
	15.0	0.3	3.8	58.0	0.5	35 35.5	6.0	—	53.2
		3.0		2.1		90 —		—	0.0
		7.4		3.0		70 —		43.00	
	18 54.8	9.8	18 57.2	7.1	18 53.0	95 —		48.2	2.3
	56.7	12.1	13.3	9.6		90 —	18 35.2	2.0	4.6
	58.9	14.5	16.4	12.0		—	37.2	2.3.4	7.0
		19.2		16.7		16.3	39.0	23.7	9.3
		21.4		19.0		18.7		28.1	14.0
		23.7		21.4		21.0		25.60 8.06	16.3
									18.6
		22.70		26.05				4.466	23.07
	18 12.83	20.70	17 58.1	8.05	17 58.50		18 3.93	4.509	5.07
	18 56.80	18 9.727	18 53.63	18 7.318	18 53.00	18 6.900	18 37.13	18 4.488	18 4.609
									18 4.548
	+18.94	18 28624	+21.21	18 28588		+21.62	18 28580	+23.84	18 28528
	−.03	− 18.90	+.01	− 21.27		−.01	− 21.68	+.05	− 23.98
		− 18.90		− 21.27			− 21.68		− 23.98
	− 1.38		−1.34			− 1.33		− 1.28	
	+17.53		+19.88			+20.28		+22.61	
	+18 27.26		+27.20			+27.15		+27.16	
	− 3.10	−.03		+.01			−.01		+.05
	0.49136n								
	0.56021n								
		+4707	+ 5.75	− 46.31		+ 8.40	− 44.60	+ 0.68	− 32.58
	ε γ	1.67274n	0.75967	1.66567n		0.92428	1.66370n	4.83225	1.51295n
	G H	1.74159n	0.82852	1.73452n		0.99313	1.73255n	4.83281	1.58180n
								9.90136	
	50 4	55 0	50 4	55 0		50 4	55 0	50 4	30 4
	21.5 29.1	14.5 19.6	14.0 16.5	18.4 18.7		9.5 14.9	13.7 18.6	18.9 22.2	57.2 60.1
	28.0 28.0	20.4 17.2	20.2 18.0	21.3 14.7		17.8 13.7	20.8 17.7	24.2 19.9	60.7 59.4
	9.5 17.1	34.9 8	34.2 14.5	36.7 18.4		27.3 8.6	34.5 16.3	43.1 42.1	119.9 119.5
	24.75 28.55	17.45 19.40	17.10 17.25	18.35 19.20		13.65 14.30	17.25 18.15	21.55 21.05	59.95 59.75
	' "	' "	' "	' "		' "	' "	' "	' "
	54 26.60	55 18.42	54 17.17	55 18.77		54 13.97	55 17.70	54 21.30	54 57.85
	− 3.63	− 55.15 + 6.74	+ 67.38	− 54.27		+ 9.84	− 54.02	+ 0.80	− 38.18
	54 23.02	23.27 54 23.91	55 24.55	23.50		54 23.81	23.68	54 22.10	21.67
+28	28 26.33	25.08 28 24.44	28 23.80	23.85		28 24.84	24.67	28 26.25	26.68
+13	52 21	53 12	52 18 12	53 13		52 08	53 12	52 15	52 84
	1.15290	1.15340	1.15280	1.15340		1.15275	1.15340	1.15280	1.15325
	+2294	+2294	+3802	+3802		+1455	+1455	+4014	+4014
	1.17584	1.17634	1.19082	1.19142		1.16730	1.16795	1.19294	1.19339
	−14.89	−15.01	−15.52	−15.54		−14.90	−14.72	−15.59	−15.61
	− .00	− .50	− .01	− .49		− .02	− .49	− .00	− .24
	− .40	− .03	− .43	− 03		− .42	− .03	− .47	− .55
	+ .17	+ .01	+ .17	+ .01		+ .17	+ .01	+ .17	+ .20
	− 15.22	− 15.53	− 15.79	− 16.05		− 14.97	− 15.23	− 15.89	− 16.20
+28	28 10.11	9.55	28 8.65	7.80		28 9.57	9.44	28 10.36	10.48
	28 9.83 +2	4.15	28 8.22 +2	4.74		28 9.50 +2	4.76	28 10.42 +2	4.43
	30 12.1	−0.6	30 12.3	−0.6		30 12.4	−0.6	30 12.5	−0.6
	+2 2.73	−+11.3	+2 4.1	−+11.5		+2 2.9	−+11.6	+2 2.1	−+11.8
	3.4	+1 52.25	5.2	+1 52.64		4.0	+1 52.56	3.2	+1 52.03
28		+30 2.08		+30 0.86			+30 2.06		+30 2.45

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1876phae.proj:1481:

	m	d			″	
Jan	21	18	28.62	3	12.1	2
	26		28.59	4	12.3	2
	31		28.55	5	12.5	1
Feb	5		28.50	6	12.6	1
	10		28.44	7	12.7	1
	15		28.37	8	12.8	1
	20		28.29	8	12.9	1
	25		28.21	9	12.4	0
Mar	1		28.12	9	12.4	0
	6		28.03	9	12.9	0
	11		27.94	9	12.9	1
	16		27.85	9	12.8	1
	21		27.76		12.7	

−.03 +.00 −.08 +.01

Feb. 8 + Feb. 16 + Feb. 17 + Feb. 23 +

m	d	m	d	m	d			m	d	m	d	m	d	m	d
17	26.1	17	35.8	17	47.1	18	9.8	17	44.5	17	32.9	17	44.6	17	25.0	17	30.9	17	42.3
	28.3		38.1		48.7		12.3		44.0		34.7		46.9		27.2		33.2		44.5
	30.2		40.4		50.2		14.5		49.3		36.8		49.2		29.7		35.7		47.3
			42.8		53.7				52.0				53.9				38.6		51.7
			45.2		57.1				56.3				56.2				40.3		54.9
			48.0		1.4	18	31.6		58.7				58.6	18	33.4		42.1		56.6
18	32.6		50.4		3.8		34.0		1.0				0.9		35.5		45.4		58.8
	34.6		52.7		6.2		35.9		3.4				3.3		38.8		47.7		1.1
	37.1		55.0		8.9				5.0				5.0				50.1		3.4
			27.4		13.2				10.4				10.3				22.6		8.2
					15.5				12.8				12.6						10.7
			31.58		31.59				34.54				34.45				26.70		38.14
			61.58		15.9				64.54				64.45				56.70		62.14
17	28.20					18	12.20			17	34.80			17	27.30				
18	34.77	18	1.580	18	1.445	18	33.50	83	17 58.673			17	58.597	18	35.90	17	56.700	17	56.491
					438														568
				18	1.442				17 58.673				17 58.591					17	56.524
		+27.03		18	28.461			+29.65	18 28.350			+29.77	18 28.334			+31.71	18	28.238
		−.02			−2.782			+.00	−2.968			−.02	−2.974			+.00		−31.771
					−2.696	2.702			−2.968	8			−2.968	74					−31.657	71
		−1.21						−1.10				−1.08				−.98			
		+25.80						+28.55				+28.67				+30.72			
		+18 27.24						+27.22				+27.26				+27.24			

+33.24 −.02 +.00 −.02 +.00

1.52166

1.59051

		− 33.33		− 13.53		− 20.30	35.16		+ 23.79					+ 29.22		− 39.28			
E	H	1.522844n		1.13130n		1.54605n			1.37639					1.46568		1.50417n			
G	H	1.59169n		1.20015n		1.61490n			1.44524					1.53453		1.66302n			
′	″																		
50	3	50	4	50	4	50	4		50	3	50	4		50	3	55	0		
″	″																		
39.5	44.7	38.9	63.1	34.2	40.5	60.6	65.2		30.5	56.4	49.8	53.2		44.8	48.5	56	10.3		
45.9	45.9	63.2	65.6	43.1	41.2	66.0	66.1		89.2	56.9	85.2	54.2		32.4	50.1	14.7	12.1		
8.54	10.6	122.1	8.7	7.73	1.7	66	11.3		9.7	1.3	105.0	7.4		97.2	98.6	2.03	2.4		
4 2.70	45.30	1.05	4.35	38.65	40.85	3.30	5.65		54.85	56.65	52.50	53.70		48.60	49.30	12.15	11.20		
′	″	′	″	′	″	′	″		′	″	′	″		′	″	′	″		
53	44.00	55	2.70	54	37.75	54	44.7		53	55.75	54	53.10		53	48.95	53	10.67		
	+ 38.95		− 39.06		− 15.85		− 41.20			+ 27.88					+ 34.24		− 46.03		
54	22.95		23.64	54	23.90		23.27		54	23.63				54	23.19		24.64		
+28 28	25.40		24.71	28	24.45		25.08		28	24.72				28	25.16		23.71		
+13 51	38	52	87	52	34	51	58		67	50				51	43	53	05		
1.15250		1.15325		1.15305		1.15270			1.15265					1.15258		1.15335			
+2107		+2107		+1206		+1206			+2112					+4200		+4200			
1.17357		1.17432		1.16511		1.16476			1.17377					1.19458		1.19535			
−14.91		−14.94		−14.63		−14.62			−14.92					−15.65		−15.68			
− .25		− .25		− .04		− .28			− .12					− .19		− .35			
− .44		− .60		− .60		− .53			− .55					− .57		− .03			
+ .15		+ .20		+ .19		+ .16			+ .16					+ .16		+ .01			
−15.45		−15.59		−15.08		−15.27			−15.48					−16.26		−16.05			
+28 28	9.95		9.12	28	9.37		9.81		28	9.29				28	8.90		7.66		
28	9.54	+2	5.13	28	9.59	+2	4.94				+2	4.78		28	8.28	+2	5.45		
30	12.7		−0.6	30	12.8		−0.6		30	12.8		−0.6		30	12.9		−0.6		
+2	3.2		−+11.9	+2	3.2		−+12.1		+2	3.5		−+12.0		+2	4.6		−+12.1		
	4.3	+1	52.63		4.3	+1	52.24			4.6	+1	52.18			5.7	+1	52.75		
28		+30	2.17			+30	1.83				+30	1.47				+30	1.03		

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	m	n				
June 29	18	2777	12	30	9.1	0
July 4		2789	13		9.1	0
9		2802	13		9.1	0
14		2815	14		9.1	1
19		2829	15		9.2	1
24		2844	15		9.3	1
29		2859	16		9.4	1
Aug. 3		2875	16		9.5	1
8		2891			9.6	

See Sup. List

1.39

July 18 +				July 19 +				July 26 +				July 31 +			
	−.90				−.88				−.76				−.86		
					−.07				−.06						
m n		m n		m n				m n				m n			
18 13.8	18 22.2	18 33.8	18 15.6	18 23.3	18 35.0	18 18.0	18 30.5	18 42.1	17 58.6	18 7.8	18 19.3				
15.6	24.6	36.1	17.3	25.7	37.2		32.9	44.4	0.5	10.1	21.6				
18.7	27.0	38.6	19.2	28.1	39.6		35.2	46.8	2.2	12.5	24.0				
	29.5	43.2		30.4	44.4		37.6	51.5		14.7	28.7				
	31.7	45.6		32.7	46.7		39.8	53.8		17.1	31.0				
19 27.1	43.7	48.0	19 22.1	34.7	49.1	19 49.2	42.7	56.2		19.0	33.4				
29.0	46.7	50.3	23.7	36.0	51.3		45.1	58.6		21.3	35.7				
31.6	49.0	52.7	26.3	38.3	53.7		47.4	61.0		23.6	38.1				
	51.3	55.1		40.6	58.4		49.7	63.4		25.9	42.8				
	13.8	57.7		14.9	0.7		22.1	7.9		57.4	45.0				
		2.0			3.0			10.2			47.5				
	1803	4671		1917	4191		2630	8779		3355	3671				
18 16.03		5271	18 17.37		5391	18 18.00		6479	18 0.43						
19 29.23	18 48.030	47.918	19 24.03	18 49.170	49.009	19 49.20	18 56.360	56.173		18 33.550	33.373				
		888			.028			.168			.708				
		18 47903			18 49018			18 56170			18 33390				
	-19.13	18 28269		-20.12	18 28298		-27.19	18 28508		-4.35	18 28662				
	-.49	+ 1963		-.48	+ 2072		-.41	+ 2766		-.43	+ 473				
	+ 1967³			-.08	+ 2078²		-.07	2772.66			+ 4798				
	-1.02			-1.05			-1.26			-1.41					
	-20.64			-21.73			-28.93			-6.19					
	+27.26			+27.29			+27.24			+27.20					
+31.87	−.49				−.48				−.41				−.43		
1.50388					−.08				−.07						
1.56921															
	−41.33		+31.65	−35.01		+38.17	−53.03			+32.96					
E F	1.61627n		1.50037	1.57419n		1.58172	1.72452n			1.51799					
G H.	1.68210a		1.56620	1.61002a		1.65078	1.79358a			1.58705					
50 4	55 1		50 4	55 0		50 4	55 1			50 4					
34.1 30.8	1.7 5.73		32.6 31.5	55.2 50.4		47.8 46.2	33.3 34.5			58.5 56.3					
40.5 35.1	7.5 3.6		40.4 36.2	0.0 56.3		46.9 40.8	34.5 28.8			55.3 50.4					
746 659	92 609		740 677	1152 67		147 70	78 633			138 67					
37.30 32.95	4.60 30.45		37.00 33.85	57.60 53.35		47.35 [illegible]	3.90 31.65			56.90 53.35					
							4542								
54 35.12	58 17.52		54 [illegible]	55 55.48		54 [illegible]	58 32.78			54 55.12					
+ 37.09	− 48.09		+ 36.83	− 40.74		44 [illegible]	62.17			+ 38.64					
55 12.21	44.43		55 12.25	14.74		55 30.17	30.61			55 33.76					
+28 27 36.14	33.92		27 36.10	33.61		27 18.18	17.74			27 14.89					
+13 51 34	53 27		51 34	52 54		51 44	53 32			51 54					
1.15250	1.15330		1.15250	1.15325		1.15255	1.15355			1.15265					
-2605	-2605		-667	-667		-690	-690			-1087					
			-2871	-2871		-702	-702								
1.12645	1.12725		1.12379	1.12454		1.14553	1.14653			1.14178					
-13.38	-13.40		-13.30	-13.32		-13.98	-14.01			-13.86					
- .22	- .39		- .23	- .28		- .33	- .64			- .25					
- .83	- .18		- .83	- .17		- .82	- .26			- .83					
+ .18	+ .044		+ .18	+ .64		+ .19	+ .06			+ .20					
-14.25	-13.93		-14.18	-13.73		-14.94	-14.85			-14.74					
++ 28 27 21.89	19.99		27 21.92	19.88		27 3.24	2.89			26 59.85					
27 20.94	+2 58.02		27 20.90	+2 49.15		27 3.07	+3 7.65				+3 10.87				
30 9.2	-0.4		30 9.2	-0.4		30 9.3	-0.4			30 9.4	-0.4				
+2 48.3	-+8.4		+2 48.3	-+8.4		+3 6.2	-+8.6			+3 9.6	-+8.6				
49.4	+2 41.22		49.4	+2 40.35		7.3	+2 58.65			10.7	+3 1.87				
28	+30 2.16			+30 1.25			+30 1.72				+30 1.72				

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1876phae.proj.1481.

Gr. 966

5h 23m 1s

+74° 57' 22"

−32° 34' 34"

α_0 m s

23 9.308

Cons − .01

$\frac{d\alpha}{dt}$ + 7.9861

δ_0 57' 25.61"

Cons − .1

$\frac{d\delta}{dt}$ + 3.229

Jan 21 26 31 Feb 5 10 15 20 25 Mar 1 6 11

23 12.53 13.35 13.14 12.89 12.62 12.32 11.99 11.65 11.30 10.94 10.57

18 21 25 27 30 33 34 35 36 37

57' 45.5 46.9 47.7 48.6 49.5 50.2 50.8 51.3 51.6 51.8 54.9

12 10 9 9 7 6 5 3 2 1

log cosδ 9.41441

15 Cos Stani 9.53936

tang δ +3.72 +3.86

sin z −.54

log I 0.89988

I 7.94

Pet 3.97

1876

Jan 26 +			Feb. 16 +		Feb. 23 +			Mar. 14 +		
+.02			+.00		+.01			−.08		
21 29.5	22 8.3		22 12.4	22 26.7	21 34.1	21 52.3	23 0.2	22 —		
35.8	12.2		19.2	30.7	39.2	59.9	6.5	—		
44.0	20.1		27.2	34.7	47.2	8.2	13.4	—		
	35.6			38.7		24.0		28.67	24.7	
	43.8			42.7		31.8		.30	28.3	
23 0.0	51.2			46.4	23 4.0.0	39.6		.53	32.5	
7.3	58.6			50.3	47.6	47.7		.46	36.4	
15.5	8.1			54.5	58.0	55.7		.49	40.4	
	24.4			58.4		11.6		.92	44.8	
	31.7					20.0				
	40.0					27.7				
	3308		60	38.31		3785				
21 36.43	57.08		22 19.93		21 40.17	43.85	23 6.70			
23 7.60	22 51.891			22 42.567	23 48.53	22 39.864		22 28.562		
+21.21	23 13.340		+29.65	23 12.238	+31.71	23 11.769	+42.32	23 10.323		
+.07	− 21.45		+.00	− 29.67	+.03	− 31.90	−.30	− 41.76		
	− 21.44			− 29.66		− 31.89		− 41.75		
−4.03			−2.93		−2.46		−1.01			
+17.25			+26.72		+29.28		+41.01			
+23 9.14			+ 9.29		+ 9.14		+ 9.57			
+75.46	+.07		+.00		+.03		−.30			
1.87772										
1.41708										
	−15.71		+22.97		+59.69	−68.67	− 38.14			
E H	1.19618n		1.36116		1.77590	1.83677n	1.58138n			
G H°	0.73554n		0.90052		1.31526	1.37613n	1.12074n			
25 2	25 2		25 2		25 2	25 3	25 2	25 3		
" "										
20.5 23.7	543 566		314 374		222 284	81 116	559 0.0	189 222		
26.8 18.4	51.0 51.3		37.8 31.4		30.6 23.7	14.1 12.7	1649 56.7	23.8 21.0		
73 42.1	113 79		92 88			222 43	1268 116.7	427 32		
23.65 21.05	58.65 53.95		34.60 34.40		2440 26.10	11.10 12.15	8.40 58.35	21.35 21.60		
" "	" "		" "		" "	" "	" "	" "		
27 22.35	27 54.80		27 34.50		27 26.25	28 11.62	28 [illegible]	28 21.47		
+ 26.13	− 5.44		+ 7.95		+ 20.66	− 23.78	− 13.21			
27 48.48	49.36		27 42.45		27 46.88	47.84	27 45.16			
+74 54 59.87	58.99		55 5.90		56 1.47	0.51	55 3.19			
−32 34 44	34 11		34 31		34 40	33 54	34 08			
1.56560	1.56545		1.56535		1.56560	1.56535	1.56545			
+3810	+3810		+12056		+4228	+4228	+2695			
1.60370	1.60355		1.57761		1.60788	1.60763	1.59240			
+40.15	+40.14		+37.81		+40.64	+40.62	+39.12			
− .78	− .03		− .07		− .48	− .64	− .20			
− .24	− .29		− .34		− .36	− .48	− .54			
+ .10	+ .12		+ .10		+ .10	+ .13	+ .12			
	+39.94		+37.56		+39.80	+39.53	+38.50			
+74 55 39.10	38.03		55 43.40		55 41.27	40.04	55 41.69			
55 39.02	+2 4.74			+2 4.94	55 40.66	+2 5.45		+2 7.84		
57 46.8	+1.2		57 50.4	+1.3	57 51.1	+1.4	57 51.9	+1.3		
+2 7.8	−+21.2		+2 7.0	−+24.8	+2 10.4	−+20.5	+2 10.2	−+26.3		
7.7	+1 44.74		6.9	+1 41.44	10.3	+1 41.35	10.1	+1 ~~43.84~~		
								H284		
74	+57 23.76			+57 24.84		+57 22.01		+57 ~~25.53~~		
								24.53		

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S Orionis

α 5h 25m 37s

δ 0° 23' 38"

+ 42° 46' 26"

α_0 25m 41.389s

Corr α − .08s

$\frac{d\alpha}{dt}$ + 3.067s

δ_0 23' 34.77"

Corr + .8"

$\frac{d\delta}{dt}$ + 2.952"

1876

Jan 21, 26; Feb 3, 5, 10, 15, 20, 25; Mar 1, 6, 11, 16, 21

m	s	'	"
25	41.5	23	33.1
4162			30.6
4158			31.0
4154			31.4
4147			31.7
4143			32.0
4137			32.3
4130			32.5
4122			32.7
4114			32.8
4106			32.8
4097			32.8
4061			32.8

3	5		
4	4		
4	4		
5	3		
6	3		
6	3		
7	2		
8	2		
8	1		
8	0		
9	0		
10	0		

log cos δ 9.99999

15 cos δ tan α 0.12494

tang δ − 0.01 + 1.00

sin z + .68

I 206

1876phae.proj.1481

ε Orionis

5h 29m 52s

−1° 17′ 2″

+43° 39′ 50″

1876

Jan. 26 +.02 | Jan. 27 −.02 | Feb. 16 +.00 | Feb. 20 −.12 | Feb. 21 −.11 | Feb. 22 +.01

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θ Orionis

α 5h 32m 28s

δ −2° 40′ 27″

+45° 03′ 15″

1876

Conv

dα/dt

δ0

Conv

dδ/dt

m s: 32 31.258 | + .01 | +3.5091 | 40′ 24.33″ | − .2 | +2.581

Feb. 16 +.00 | Feb. 20 −.12 | Mar. 14 −.08 | Mar. 19 +.02 −.06

Feb. 16		Feb. 20		Mar. 14		Mar. 19	
m s	m s	m s	m s	m s	m s	m s	m s
31 36.2	31 50.3	31 45.3	31 49.5	31 38.8	31 37.2	31 22.4	31 35.4
38.1	52.6	47.0	51.5	41.0	39.3	24.4	37.4
39.8	54.4	48.4	53.6	42.9	41.4	26.0	39.5
	55.6		57.8		45.4		43.8
	0.7		59.9		47.6		45.9
32 2.0	2.6	32 3.5	5.0		49.7		47.8
2.7	4.6	3.3	3.8		51.7		49.9
2.9	6.8	3.9	6.0		53.8		51.9
	8.9		10.2		55.8		56.1
	12.9		12.2		59.9		58.2
	15.0		14.3		2.0		0.2
	26.94		32.08		48.58		46.61
31 38.03	29.4	31 46.90	20.8	31 40.90	54.58	31 24.27	52.61
32 22.85	32 2.673	32 3.693	32 1.891		31 49.618		31 47.827
+24.66	32 32.302	+30.38	32 32.246	+42.32	32 31.882	+44.04	32 31.792
−.00	− 29.63	tio	− 30.36	+.00	− 42.26	−.00	− 43.96
−.00	− 29.64		− 30.37		− 42.27	+.06	− 43.97
−1.04		− .99		− .62		− .53	
+28.62		+29.40		+41.70		+43.57	
+32 31.29		+31.29		+31.32		+31.40	
+24.64	−.00		+.01		+.00		−.00
1.39164							+.06
1.51612							
	−20.20	+14.99	−35.04	+8.72		+23.56	
ξ η	1.30535n	1.17580	1.54456n	0.94052		1.37218	
ψ ℏθ	1.42983n	1.30028	1.66904n	1.06500		1.49666	
′ ′							
0 3	0 4	0 3	0 4	0 4		0 3	
38.4 40.7	38.7 40.0	30.4 33.8	59.0 58.6	4.1 2.6		41.9 39.9	
43.4 44.6	42.2 44.7	33.4 37.1	60.8 64.4	6.4 12.0		47.4 52.6	
5.8 5.3	8.9 4.7	3.8 10.9	11.8 12.30	10.5 14.6		9.3 9.25	
40.90 42.65	40.45 42.35	51.90 55.45	59.90 1.50	5.25 7.30		44.65 46.25	
′ ″	′ ″	′ ″	′ ″	′ ″		′ ″	
3 41.77	4 41.40	3 53.67	5 0.70	4 6.27		3 45.45	
+ 32.82	− 26.90	+ 19.97	− 46.67	+ 12.61		+ 31.38	
4 14.59	14.50	4 13.64	14.03	4 17.88		4 16.83	
−2 41 26.24	26.15	41 25.29	25.68	41 29.53		41 28.48	
1 36	2 35	1 48	2 55	2 00		1 89	
1.76020	1.76050	1.76025	1.76055	1.76030		1.76020	
+1206	+1206	+2664	+2664	+2709		+3318	
1.77226	1.77256	1.78689	1.78719	1.78739		1.79338	
−59.19	−59.23	−61.22	−61.26	−61.29		−62.14	
+ .02	+ .01	+ .01	+ .03	+ .00		+ .02	
− .48	− .61	− .55	− .70	− .74		− .72	
+ .15	+ .19	+ .16	+ .20	+ .16		+ .15	
−59.50	−59.64	−61.60	−61.73	−61.87		−62.69	
−2 42 25.74	25.79	42 26.89	27.41	42 31.40		42 31.17	
42 25.77	+2 4.94	42 27.15	+2 6.73	+2 7.84		+2 8.44	
40 22.4	−1.8	40 22.6	−1.8	40 23.2	−1.8	40 23.2	−1.8
+2 3.4	−+1.9	+2 4.6	−+1.7	+2 8.2	−+1.1	+2 8.0	−+1.2
3.2	+2 1.24	4.4	+2 3.23	8.0	+2 4.94	7.8	+2 5.44
−2	−40 24.53		−40 23.92		−40 26.46		−40 25.73

log cos δ 9.99953

15 constant 0.12448

tang δ −.05 +1.00

sin z +.71

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2 Columbae

5h 35m 3

−34° 8′ 30″

+76° 31′ 18″

	m	s	
α	35	9.611	Jan. 30
		2	4
dα/dt		+2.173	9
			14
δ	8	28.05	17
dδ/dt		+2.15	

N.A.

m	s			
35	11.01		−8′	31.0
	10.93	8		31.9
	10.85	8		32.7
	10.76	9		33.4
	10.66	10		34.0

9
8
7
6

log cos δ 9.9177 85
15 cos δ sin i 0.04285 80
tang δ −0.68 +1.21
sin Z +.97

1876

−.02 −.12

Jan 27 Feb. 20

34	28.7	34	84.3	34	48.1	34	—
	30.6		86.7		50.2		—
	33.6		89.3		52.0		—
			44.2				35.0
			46.8				37.6
35	23.9		49.4	35	22.0		40.3
	26.0		51.8		26.1		42.7
	29.0		54.3		29.4		45.0
			56.3				—
			1.8				—
			4.2				
			42.2				2.06
34	30.97		54.22	34	50.10		
35	26.30	34	49.291	35	25.83	34	40.120
					17		
	+21.64	35	11.06		+30.38	35	10.65 4
	7.01				7.08		
	−1.45				−1.03 3		−1.24
	+20.20				+29.43 3		
	35 9.49				9.5 5		

5h 35m 9.520

	+18.52		7.01				7.08
	1.26764						
	1.31044						
			−37.01		−9.98		−45.05
	E		F				
	1.568322				0.999132		1.653692
	G		H				
	1.61112m				1.04193m		1.69649m
	25	3	25	4	25	3	25 4
	5.9	5.3	583	584	230	262	13.6 16.2
	2.6	4.1	1.9	6.1	28.9	29.5	68.6 71.2
	1205	1234	1202	1245	119	157	122 1364
	0.25	1.70	0.10	2.25	25.95	27.85	6.10 8.20
	29′	0.″97	30′	1.″17	28′	26.″90	30′ 7.″15
	+	20.49	—	40.84	—	11.02	— 49.71
	29	21.41		26.33	28	15.88	17.44
−34	6	33.06		31.98	6	27.53	29.09
+ 76	26	55	27	58	26	21	28 01
	2.36995		2.37045		2.36978		2.37053
	+1480		+1480		+2680		+2680
	2.38475		2.38528		2.39646		2.39733
	−242.52		−242.82		−249.15		−249.65
	+ .09		+ .35		+ .03		+ .37
	− .40		− .50		− .48		− .71
	+ .16		+ .20		+ .14		+ .20
	−4 2.67		−4 2.77		−4 9.46		−4 9.65
−34	10 35.73		34.75		10 36.99		38.74
	10 35.24	+2	4.76		10 37.86	+2	6.73
	8 30.4		−2.2		8 34.1		− 2.3
			+ 2.4				+ 6.0
		+2	4.96			+2	8.43
	−34	8	30.28			8	28.43

−34° 8′ 28.85

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9 Leporis

5h 41m 17s

−14° 52′ 14″

+57° 15′ 02″

log cos δ 9.98521

15 cos δ tang δ 0.11016

tang δ −0.27 +1.04

sin z +.84

1876

	−.02	+.01	−.08	+.02 −.06
	Jan. 27	Feb. 22	Feb. 27	Mar. 19
m s	m s	m s	m s	m s
40 38.8	40 47.1	40 24.5	40 37.1	40 18.4 40 33.7	40 17.7	40 24.0
40.0	49.2	26.7	39.3	20.3 35.7	19.2	26.1
41.6	51.4	29.2	41.2	22.5 37.9	21.2	28.2
	53.6		43.6	42.0		32.6
	57.5		47.7	44.2		34.6
41 37.9	59.8	41 28.3	49.9	41 24.2 46.3	41 8.3	36.8
	0.20	30.9	52.0	26.4 48.4	9.7	38.9
	4.1	33.3	54.1	28.2 50.6	11.6	40.9
	8.3		58.4	53.0		45.3
	10.5		0.6	57.0		47.4
	12.6		2.7	59.0		49.6
	3583		4286	5098		4044
40 40.13	6583	40 26.80	5486	40 20.40	40 19.37	
41 37.90	40 59.845	41 30.90	40 44.873	41 26.27	40 46.345	41 9.87	40 36.764
	+21.64	+31.38	+34.91	+44.05
	+.00	−.00	+.02	−.00
				−.06
	−1.30	−.98	−.87	−0.52
	+20.34	+30.40	+34.06	+43.47
	41 20.18	20.27	20.40	20.23

5h 41m 20.270

+19.71	+.00	−.00	+.02		−.00
1.29469					−.06
1.40485−					
	−38.06	+23.07	−41.03	+25.94	−39.93	+17.39	−33.11
ε ″	1.58047m	1.36365	1.61310m	1.41397	1.60130m	1.24030	1.57996m
φ ″	1.69063m	1.47321	1.72326m	1.52413	1.71146m	1.35046	1.63012m
′ ′	15 0	15 1	15 0	15 1	10 4	15 1	15 0	15 1
″ ″	1.3 1.4	16.2 16.7	0.4 5.5	22.2 21.6	5.6 5.3	20.9 18.2	7.3 6.1	13.2 10.2
	4.1 5.8	18.8 22.8	3.5 7.4	23.9 28.8	5.8.0 4.1	22.7 28.5	12.2 19.6	17.2 23.9
	5.4 7.2	13.0 39.5	3.9 12.69	6.1 10.4	13.6 11.78	3.6 46.7	19.5 25.7	10.4 3.41
	2.70 3.60	17.50 19.75	1.95 3.45	23.05 25.20	5.6.80 58.90	2.180 23.35	9.75 12.85	15.20 17.05
	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″	′ ″
	15 3.15	16 18.62	15 2.70	16 24.12	14 57.85	16 22.57	15 11.30	16 16.12
	+ 25.40	− 49.05	+ 29.73	− 52.87	+ 33.43	− 51.46	+ 22.41	− 42.67
	15 28.55	29.57	15 32.43	31.25	15 31.28	31.11	15 33.71	33.45
+ −14	52 40.20	41.22	52 44.08	42.90	54½ 42.93	42.76	52 45.36	45.10
57	12 57	14 13	12 57	14 18	12 52	14 17	13 05	14 10
	1.95018	1.95052	1.95018	1.95054	1.95017	1.95054	1.95078	1.95052
	+1490	+1490	+2125	+2125	+2905	+2905	+3346	+3346
	1.96508	1.96542	1.97143	1.97179	1.97922	1.97959	1.98347	1.98398
	−92.27	−92.35	−93.63	−93.71	−95.33	−95.41	−96.81	−96.38
	+ .05	+ .20	+ .07	+ .23	+ .09	+ .22	+ .04	+ .15
	− .01	− .13	− .00	− .21	− .24 .50	− .22	− .04	− .25
	+ .00	+ .05	+ .00	+ .06	+ .20	+ .06	+ .01	+ .05
	−132.23	−132.23	−133.56	−133.63	−135.84	−135.35	−136.30	−136.43
+ −14	54 12.43	13.45	54 17.64	16.53	54 18.77	18.11	54 21.66	21.53
	54 12.94	+2 4.76	54 17.08	+2 6.02	54 18.44	+2 6.03	54 21.59	+2 8.44
		−1.9		−2.1		−2.1		−2.1
		−1.0		+1.8		+2.3		+2.6
		+2 1.86		+2 5.72		+2 5.83 6.23		+2 8.94
		52 11.08		52 11.36		52 12.61 12.21		52 12.65

− 14° 52′ 11.82″

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1876phae.proj.14811

ψ Daacoris do 44 8.73 Feb 28 44 6.83 36 12 42 7 log cosδ 9.48490n log I 0.82939

17h 44m 10s Cons + .10 Mar 1 7.19 36 3.5 6 15 cos δ sin z 9.60985n I 6.75

+72° 12' 34" dα/dt −1.0867 6 11.53 37 2.9 4 tan q −3.12 −3.27 ½I 3.38

+107° 47' 26" dδ/dt 12 32.50 11 4.72 37 2.5 8 sin z −.91

−65° 24' 38" Cons 47 27.50 8.29 2.2

dδ/dt + .14

dα/dt −1.652

1876

+.01 −.08 −.17

Feb. 22 × ~~Feb. 29~~ × Mar. 6 ×

43 30.4 43 — 43 37.0 43 18.6 43 6.0 43 15.9

— 40.0 22.0 11.7 18.9

A 2.3.4. — 50.0 28.3 18.6 22.5

— 10.1 25.7

— 32.5 29.1

44 6.4 19.02 22.4 44 15.2 46.0 43 58.4 32.7

18.64 25.4 22.5 39.4 36.2

18.86 29.0 29.5 42.9 39.6

19.18 32.7 46.2 42.9

35.92

35.54

35.76

36.08

2920 2635

43 30.40 43 43.67 43 32.44 43 12.10

44 6.40 43 18.925 35.825 44 23.50 43 39.40 43 29.278

+31.39 44 6956 +34.91 44 7442 +38.45 44 7901

−.03 — 4813 3113 ±25 — 3502 ±.53 — 3862

— 4813 31.13 — 35.12 — 38.72

+1.75 +1.25 +.81

+33.11 +36.41 +39.79

+44 8.93 +44 8.85 + 9.07

+5.42 −.03 +.25 +.53

0.73400

0.34385n

−30.58 −11.23 −5.06 +17.18 −30.12

E F 1.48544n 1.05038n 1.70808n 1.23502 1.47886n

G Fo 1.09529 0.66023 1.31793 0.84487n 1.08871

35 3 35 3 35 4 35 3 35 4 35 3

54.4 31 43.1 50.8 4.0 11.2 47.4 54.9 4.8 16.7 47.1 57.3

3.3 57.2 51.6 45.7 13.9 9.8 57.1 53.2 20.2 12.6 898 53.7

1177 120.3 94.7 96.5 17.9 21.0 1045 81 25.0 9.3 1069 11.0

58.85 0.15 47.35 48.25 8.95 10.50 52.25 54.05 12.50 14.65 53.45 55.50

38 59.50 38 47.80 39 9.72 38 53.15 39 13.57 38 54.47

− ~~22.0~~ 22.1 + 12.45 + 4.57 + 20.80 − 7.00 + 12.07

~~38 37.43~~ 39 0.25 39 14.29 13.95 39 6.57 6.74

107 38 57.29

+ ~~72~~ 43 51.06 43 48.10 43 34.06 34.40 43 41.78 41.61

−65 23 06 23 18 22 56 23 13 22 52 23 12

2.09693 2.09700 2.09687 2.09697 2.09687 2.09697

+21.26 +21.26 +29.05 +29.05 +6.29 +6.29

2.11818 2.11825 2.12592 2.12602 2.10316 2.10326

+131.22 +131.30 +133.63 +133.67 +126.81 +126.84

+ .01 + .16 + .02 + .42 + .05 + .14

− .60 − .57 − .67 − .62 − .71 − .66

+ .16 + .15 + .17 + .16 + .17 + .16

+2 10.84 +2 11.04 +2 13.15 +2 13.63 +2 6.32 +2 6.48

+107 46 6.90 45 59.14 45 47.21 48.03 45 48.10 48.04

46 0.52 +2 ~~6.85~~ 6.82 45 47.62 +2 7.60 45 48.09 +2 6.75

47 56.0 +2.3 47 57.0 +2.3 47 57.5 +2.3

+1 55.5 −+28.5 +2 9.4 −+24.5 +2 9.4 −+30.0

55.1 +1 39.82 9.0 +1 38.83 9.0 +1 39.03

107 +47 40.34 +47 26.45 +47 27.12

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α Orionis

5 m 48 s 24
+7° 22' 53"
+34 59 55

α_0 m 48 2.538
Cons s −.02
$\frac{d\alpha}{dt}$ +3.2479
δ_0 22 54.50
Cons " +.8
$\frac{d\delta}{dt}$ +1.509

log cos δ 9.99638
15 constants 0.12133 Jan–Feb
0.11831 July 18–19
0.12154 July 24.25.31
tang δ + 0.13 +1.61 Aug. 2.3.
sin z +.57

log I 0.31790
log R+2 1.26902
log R−2 1.27489
I 2.08
R+2 18.579
R−2 18.832
I' .126

1876

Jan. 27 +			Feb. 17 +			Feb. 22 +			Feb. 29 +		
−.02			−.03			+.01			−.08		
m s	m s	m s	m s	m s	m s	m s	m s	m s	m s	m s	m s
48 3.6	47 44.4	47 54.7	47 30.2	47 36.2	47 46.4	47 48.0	47 34.4	47 44.7	47 23.1	47 —	47 41.4
3.6	46.5	56.8	32.1	38.3	48.6	49.9	26.3	46.8	25.6	—	43.3
7.6	48.5	58.9	34.0	40.4	50.6	52.0	38.5	49.0	28.0	—	45.4
	50.7	3.0		42.5	54.7		40.7	53.0		—	49.4
	52.7	48560 5.1		44.5	40380 56.8		42.8	38540 58.1		84	51.5
48 37.6	21.8	7.2	48 29.7	13.4	58.8	48 34.6	11.9	57.1		10.4	53.8
39.3	24.0	9.3	30.9	15.6	0.9	36.7	18.9	59.2		12.6	55.8
41.6	26.0	11.3	33.3	17.8	3.0	38.7	16.1	1.3		14.6	57.8
	28.0	13.5		19.9	5.2		18.0	5.5		14.6	1.9
	30.2	26.880 17.7		21.7	17.720 9.2		20.3	16.040 7.4		16.6	4.0
		19.6			11.3			9.7			6.2
	37.28	25.91		29.05	34.75		27.29	38.91		12.520	41.05
48 5.60	72.8	79.1	47 32.10	54.05	62.75	47 19.97	57.29	62.91	47 25.57		59.05
48 39.50	48 7.280	48 7.191	48 31.13	47 54.050	47 58.864	48 36.67	47 57.290	47 57.141		53.688	47 53.682
		.154			.924			.164			
		48 7.172			47 58.894			47 57.178			47 53.685
	+21.64	48 28.865		+29.76	48 28.678		+31.39	48 28.608		+34.90	48 28.510
	−.00	— 21.69		−.00	— 29.78		+.00	— 31.43		−.01	— 34.82
		— 21.67			— 29.76			— 31.41			— 34.80
	−1.33			−1.14			−1.07			−.97	
	+20.31			+28.62			+30.32			+33.92	
	+48 27.48			+27.51			+27.50			+27.60	
+1.57	−.00			−.00			+.00			−.01	
9.195.90											
0.31723											
	−32.33	+26.79	+26.79	−32.24		+7.21	−39.49			+28.11	
ε	1.509618		1.42797	1.508402		0.85794	1.596492			1.44886	
η	1.63094 m		1.54930	1.62973 m		0.97927	1.71782 m			1.57019	
° '	° '		° '	° '		° '	° '			° '	
	0 1		0 0	0 1		0 0	0 1			0 0	
" "											
3.0 7.2	472 309		290 33.1	484 30.2		560 04	597 619			299 32.4	
9.4 11.4	527 348		35.9 38.1	541 55.2		29 4.9	642 672			35.3 38.2	
12.4 18.6	979 57		649 112	1025 54		1189 53	1239 91			652 106	
6.20 9.30	4995 52.85		32.45 35.60	51.25 52.70		5945 265	195 455			32.60 35.30	
' "	' "		' "	' "		' "	2' "			' "	
1 7.75	1 51.40		0 34.02	1 51.97		1 1.05	2 32.5			0 33.95	
+ 2.08	— 42.75		+ 35.42	— 42.63		+ 9.53	— 52.22			+ 37.17	
1 9.83	8.65		1 9.44	9.34		1 10.58	11.03			1 11.12	
+7 21 38.52	39.70		21 38.91	39.01		21 37.77	37.32			21 37.23	
34 59 02	59 45		58 28	59 48		58 55	59 67			58 28	
1.60500	1.60524		1.60490	1.60524		1.60500	1.60530			1.60490	
+1495	+1495		+2182	+2182		+2186	+2186			+2919	
1.61995	1.62019		1.62672	1.62706		1.62636	1.62646			1.63409	
−41.68	−41.70		−42.34	−42.37		−42.30	−42.33			−43.07	
− .00	− .07		− .05	− .07		− .01	− .11			− .05	
− .11	− .18		− .08	− .25		− .15	− .30			− .10	
+ .04	+ .07		+ .02	+ .07		+ .04	+ .08			+ .02	
−41.75	−41.88		−42.45	−42.62		−42.42	−42.66			−43.19	
+7 20 56.77	57.82		20 56.46	56.39		20 55.35	54.66			20 54.04	
20 57.30	+2 4.76		20 56.48	+2 4.78		20 55.00	+2 6.02				+2 6.03
22 602	−1.2		22 592	−1.4		22 59.1	−1.4			22 589	−1.5
+2 2.9	−+5.7		+2 2.8	−+4.7		+2 4.1	−+4.6			+2 4.9	−+4.4
3.7	+1 57.86		3.6	+1 58.68		4.9	+2 0.82			5.7	+2 0.13
7	+22 55.16			+22 55.10			+22 55.02				+22 54.17

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	m	s		′	″	
July 19	48	28.34	12	23	6.4	5
24		28.46	12		6.9	5
29		28.58	13		7.4	5
Aug. 3		28.71	13		7.9	4
8		28.84	14		8.3	4
13		28.98	14		8.7	4
18		29.12	14		9.1	3
23		29.26	15		9.4	3
28		29.41	15		9.7	2
Sept 2		29.56	15		10.1	2
7		29.71	15		10.3	2
12		29.86	16		10.4	1
1876 17		30.02				

July 18 +

| | | | |

1876phae.proj.1481

See Sup. List p. 42

1876

−.80 | −.84 | −.88 | −1.05

July 31 + | Aug. 2 + | Aug. 3 + | Aug. 6 Coh. J.

48 17.2 19.6 21.0 | 48 10.4 12.4 14.5 16.7 18.7 | 14.50 | 48 20.7 22.7 24.8 29.0 31.0 | 48 11.4 13.2 14.7 | 48 12.3 14.4 16.4 18.4 20.5 | 16.400 | 48 22.5 24.5 26.7 30.9 33.0 | 48 9.1 10.7 12.3 | 48 13.2 15.3 17.4 19.5 21.6 | 17.40 | 22.6 25.6 27.7 31.9 34.0

49 5.0 6.6 8.0 | 49 4.8 9.8 12.0 14.0 16.1 | 14.90 | 49 33.1 35.1 37.3 41.4 43.5 45.5 | 49 2.2 4.0 6.0 | 49 9.7 11.8 13.8 15.6 [58.0] 59.0 | 15.380 | 49 35.0 37.1 39.1 43.3 45.5 47.5 | 49 7.1 9.1 11.0 | 49 10.7 12.8 14.8 17.0 19.0 | 15.480 | 36.0 38.0 40.3 44.4 46.4 48.4

3324 | 3641 | 3513 | 3851 | 3613 | 3963

48 19.27 49 6.53 | 48 33.244 | 33.100 114 | 48 13.10 49 4.07 | 48 35.730 | 35.009 084 | 48 10.70 49 9.07 | 48 36.130 | 36.027 044

48 38.107 | 48 35.006 | 48 36.016

−4.36 | 48 28.638 | −6.10 | 48 28.690 | −7.19 | 48 28.716

−.10 + 4.47 | −.11 + 6.32 | −.11 + 7.30 | −.14

+ 4.99 | + 6.34 | + 7.32

−1.10 | −1.15 | −1.18

−5.56 | −7.36 | −8.48

+27.55 | +27.65 | +27.54

+13.84 | −.10 | −.11 | −.11 | −.14

1.14114

1.26268

−33.42 | 21.91 +22.11 | −29.06 | − | +25.32 | −33.05

1.52401 m | 1.34064 | 1.46330 m | 1.40346 | 1.51917 m

E 7 G 16 | 1.64555 m | 1.46218 | 1.58484 m | 1.52500 | 1.64071 m

0 1 | 0 2 | 0 1 | 0 2 | 0 1 | 0 2 | 0 2

54.4 52.2 | 56.9 53.7 | 43.3 40.2 | 50.9 46.9 | 38.8 86.2 | 56.9 53.3 | 16.8 12.1

51.3 50.8 | 53.7 52.8 | 39.7 38.0 | 47.1 46.0 | 34.8 33.9 | 52.9 52.1 | 11.8 11.4

57 30 | 106 65 | 830 782 | 980 9 | 136 101 | 98 54 | 286 235

52.85 51.50 | 55.30 53.25 | 41.50 39.10 | 49.00 46.45 | 36.80 35.85 | 54.90 52.70 | 14.30 11.75

1 52.18 | 2 54.28 | 1 40.30 | 2 47.72 | 1 35.92 | 2 53.80 | 2 13.02

+ 18.31 | − 44.21 | + 28.99 | − 38.45 | + 33.50 | − 43.73

2 10.49 | 10.07 | 2 9.29 | 9.27 | 2 09.42 | 10.07

+7 20 37.86 | 38.28 | 20 39.06 | 39.08 | 20 38.93 | 38.28

34 58 51 | 59 53 | 58 39 | 59 47 | 58 35 | 59 53

1.60500 | 1.60330 | 1.60490 | 1.60524 | 1.60490 | 1.60530

−1200 | −1200 | −687 | −687 | −1055 | −1055

1.59300 | 1.59330 | 1.59803 | 1.59837 | 1.59435 | 1.59475

−39.17 | −39.20 | −39.63 | −39.66 | −39.30 | −39.33

− .01 | − .08 | − .03 | − .06 | − .04 | − .08

− .32 | − .51 | − .37 | − .48 | − .27 | − .49

+ .08 | + .12 | + .67 | + .11 | + .06 | + .12

−39.42 | −39.60 | −39.88 | −40.09 | −39.55 | −39.78

+7 19 58.44 | 58.61 | 19 59.18 | 58.99 | 19 59.38 | 58.50

19 58.52 +3 10.87 | 19 59.08 +3 10.58 | 19 56.94 +3 11.48

23 7.8 | −1.1 | 23 7.8 | −1.1 | 23 7.9 | −1.2 | −1.2

+3 9.1 | −+13.1 | +3 8.7 | −+13.3 | +3 11.0 | −+13.4

9.9 +2 56.67 | 9.5 +2 56.18 | 11.8 +2 56.88

7 +22 55.19 | +22 55.26 | +22 53.82

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β Aurigae

| | | |

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35 Draconis α_0

17 h 55 m 3 s

+76° 58' 40"

+103° 01' 20"

−60° 38' 32"

1876

Feb. 22 +.01

Feb. 29 −.08

Mar. 6 −.17

Mar. 7 −.15 −.10

Mar. 19 +.02 −.06

log coef 9.33263

log I 0.96166

I 9.15

½i I 458

I .554

tang s −4.32 −4.44

sin z −.87

	Feb. 22	Feb. 29	Mar. 6	Mar. 7	Mar. 19
α_0	54 59.894	54 56.79	54 56.79	53 55.1	53 39.93
Corr	+.24	57.24	57.24	55.1	40.1
		51.70	51.70	55.8	39.0
		58.18	58.18	4.3	52.3
		58.67	58.67	9.8	47.7
		59.16	59.16	13.7	5.23
		59.66	59.66	18.3	1.3
				23.3	10.8
				27.7	
				32.2	
				36.6	
$\frac{dx}{dt}$	−2.6964				
δ_0	58 39.66				
	1 20.34				
Corr	+.12				
$\frac{d\delta}{dt}$	−0.203				

	54 19.9	54 7.6	54 24.4	54 4.0	54 20.7	54 —	53 55.1	53 59.8	53 31.1	53 20.7	53 37.5									
	33.6	12.2	32.0	9.1	—	—		4.3	41.0	30.4	1.7									
	43.0	16.8	37.5	14.2				9.8	47.7	39.0	6.0									
		21.1		18.5				13.7		52.3	10.7									
		25.8		22.8		1930	19.3	18.3		1.3	15.3									
		30.1	55 7.1	27.3	53 46.6	[18.62]	23.2	23.3	54 44.5	10.8	20.1									
		35.0	10.4	31.5		19.24	28.4	27.7			25.0									
		39.5	22.3	36.2		.36	33.1	32.2			29.6									
		43.8		40.7		.38	37.7	36.6			34.2									
	54 32.83		54 31.30	20.43	54 30.20		53 55.10	22.57	53 39.93		20.01									
		54 25.767	55 13.27	54 22.700	55 46.60	54 19.320		54 44.50	54 18.411	54 48.90	15.750	15.567								
												.196								
											54	15.382								
	+31.39	54 56.947	+34.90	54 57.583	+38.46	54 58.156	+39.23	54 58.253	+44.05	54	59.135									
	−.04	− 31.18	+.34	− 34.88	+.73	− 38.84	+.65	− 39.84	−.09	−	44.05									
		− 31.42		− 35.12		− 39.08	+.44	− 40.08	+.27		− 44.29									
	+2.95		+2.31		+1.73		+1.64		+.46											
	+34.30		+37.55		+40.92		+41.96		+44.69											
+55	0.07		+55	0.25	+ 0.24		+ 0.37		+ 0.07											
		−.04		+.34		+.73		+.65 +.44			−.09 +.27									
		−7.06		− 8.60		− 50.57		− 10.88		− 87.28		+ 23.31		− 26.09		+ 35.45		− 38.52		
ε	A	0.84		0.93		1.70359		1.03663		1.91091		1.36754		1.41647		1.54962		1.52530		
g	k	0.82638		0.41208		1.18147		0.51421		1.41849		0.84572		0.89405		1.02720		1.00288		
		20 4		20 4		20 4		20 4		20 4		20 4		20 4		25 0		20 4		
		47.2 55.7		52.0 57.1		37.8 44.1		40.9 50.2		18.7 27.2		51.6 59.7		36.3 43.6		3.6 9.9		43.8 49.7		
		52.6 49.4		60.1 53.3		47.5 41.3		54.8 47.5		30.8 24.3		8.1 0.9		52.7 45.7		16.8 10.6		53.9 49.0		
		99.8 101.1		113.1 106.4		85.3 85.4		95.7 97.7		49.5 51.5		119.7 120.6		89.0 89.3		20.4 20.5		97.7 98.7		
		49.40 52.65		56.55 56.75		55.05 55.20		42.65 42.70		47.85 48.85		24.75 25.75		59.85 0.30		44.50 44.65		10.20 10.25		48.85 49.35
		24 51.22		24 56.65		24 55.12		24 42.67		24 48.35		24 25.25		25 0.07		24 44.57		25 10.22		24 49.10
		+ 2.12				+ 2.58		+ 15.19		+ 3.27		+ 26.21		− 7.00		+ 7.84		− 10.64		+ 10.06
		24 53.34				24 57.70		57.86		24 51.62		24 51.46		24 53.07		52.41		24 59.58		59.16
103										56.73		56								4
+ 76		57 55.01				57 50.65		50.49		57 57.33		57.89		57 55.28		55.94		57 48.77		59.19
−60		37 15				37 11		37 23		37 18		37 41		37 06		37 21		36 56		37 17
		2.00822				2.00822		2.00828		2.00823		2.00837		2.00819		2.00825		2.00814		2.00825
		+2147				+2940		+2940		+673		+673		+117		+117		+3373		+3373
		2.02969				2.03742		2.03768		2.01498		2.01510		2.00936		2.00942		2.04187		2.04198
		+107.08				+109.05		+109.06		+103.51		+103.64		+102.18		+102.19		+110.12		+110.15
		+ .01				+ .01		+ .30		+ .01		+ .91		+ .04		+ .08		+ .15		+ .13
		− .72				− .78		− .75		− .82		− .74		− .85		− .80		− .04		− .91
		+ .19				+ .20		+ .19		+ .19		+ .18		+ .20		+ .19		+ .01		+ .19
		+ 1 46.56				+ 1 48.48		+ 1 48.80		+ 1 42.89		+ 143.89		+ 141.59		+ 1 41.66		+ 1 50.24		+ 1 49.56
+103		59 41.87				59 39.13		39.29		59 39.62		40.36		59 36.87		37.60		59 39 01		38.75
			+2	685		59 39.21	+2	740		59 40.20	+2	6.78		37.24	+2	8.87		38.88	+2	8.70
		1 48.1		+2.3		1 49.30		+2.3		1 49.7		+2.3		1 49.8		+2.3		1 50.1		+2.2
		+2 6.5		+27.8		9.8		+28.7		9.5		+29.4		12.6		+29.4		11.2		+29.8
		6.3		+1 40.52		9.6		+1 39.63		9.3		+1 39.63		12.4		+1 41.77		11.0		+1 40.84
103		+ 1 1 22.09				+1 0 18.84		+1		1 19.83		+1		1 19.01		+1		1 19.72		

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36 Camelop.

α_0 — $\Delta\alpha$ — $\frac{d\alpha}{dt}$

δ_0 — Condδ — $\frac{d\delta}{dt}$

log cos δ 9.61382

15 cos δ tan$i$ 9.73877

I' .304

tang δ +2.22 +2.43

sin z −.40

1876

Feb. 29 +				Mar. 6 +				Mar. 7 +				Mar. 19 +			

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22 H Camelop. 2

6 5 4 Cons

+69° 21' 35" d_2

− 26° 58' 47" d_0

Cons' $\frac{dd}{dt}$

1876

Feb 29 +

Mar. 6 +

Mar. 7 +

Mar. 19 +

log cos δ 9.54702

15 cos l sin 9.67197

tang +265 +2.841

sin z −.45

I 583
47 296
I 1 355

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Lyncis

α 8m 36s

+59° 3' 10"

−16° 40' 22"

α_0 8m 41s.98

Cons $-.22$

$\frac{d\alpha}{dt}$ $+5.3034$

δ_0 3' 9".25

Cons $+.5$

$\frac{d\delta}{dt}$ $-0.''745$

Mean 1 — 8m 43s.04 — 42.89 — 42.73 — 42.56 — 42.38

15 3' 29".7 — 16 30.0 3 — 17 30.3 3 — 18 30.5 2 — 30.6 1

log cos δ 9.71121

15 constant 9.83616

tang δ +1.67 +1.95

sin z −.29

±.243

1876 −.08 −.17 −.15 −.10 +.02 −.06

Feb. 29 + Mean. 6 + Mean. 7 + Mean. 19 +

7	21.9	7	44.1	7	39.3	7	40.6	7	17.1	7	53.7	7	5.4	7	34.7
	25.3		47.9		42.8		44.6		19.8		57.8		8.5		38.1
	29.2		52.0		46.0		48.6		23.2		59.4		12.2		42.1
			59.9				56.4				1.8				50.1
			3.9				0.5				3.8				30.3
8	23.2		8.0	8	40.1		4.4	8			5.7				37.1
	26.6		12.0		43.6		8.5				7.0				26.3
	29.0		16.2		47.3		12.3				9.8				30.4
			24.0				20.4				11.8				34.4
			28.2				24.5								38.5
			32.1				28.5								42.6
															22.2
			32.83				28.93				21.40				28.38
7	25.47		8.83	7	42.70		4.93	7	20.03		3.40	7	5.90		5.83
8	25.93	8	8.027	8	43.67	8	4.482			8	3.778				58.380
														7	58.117
	+34.90	8	43.062		+38.96	8	42.882		+39.23	8	42.850		+44.06	8	42.443
	−.13		−3.504		−.28		−38.98		−.25		−39.07		+.03		−44.33
			−34.82				−38.18		−.20		−38.85		−.12		−44.11
	−1.96				−1.78				−1.75				−1.34		
	+32.81				+36.40				+37.03				+42.63		
+8	40.84				+40.88				+40.81				+40.75		
	42.58														
	+6446		−.13				−.28				−.25				+.03
	1.62900	1									−.20				−.12
	1.46516														
			−17.90		+21.78		−39.19		+43.75				+49.22		
6	7		1.25285n		1.33806		1.59318n		1.64098				1.69214		
9	h		1.08901n		1.17422		1.42934n		1.47714				1.52830		
	'		'		'		'		'		'		'		'
	20	1	20	1	20	1	20	2	20	1	20	+	20	1	
	"		"		"		"		"		"		"		"
	10.1	12.8	5.16	5.38	2.12	2.49	4.3	6.6	9.2	10.2	6.5	8.6	6.8	8.6	
	16.4	13.8	5.72	5.50	2.84	2.79	10.3	8.4	17.2	17.6	14.8	12.9	14.8	12.9	
	6.5	6.6	8.8	8.8	9.6	12.5	14.6	16.0	28.4	7.8	21.6	21.5			
	1325	1330	5440	5440	24.80	26.40	7.30	7.50	14.20	13.90	1050	1075	1080	1075	
	'	"	'	"	'	"	'	"	'	"	'	"			
	21	13.27	21	54.40	21	25.60	22	7.40	21	14.05	21	10.77	21	10.77	
	+ 29.18		− 12.28		+ 14.94		− 26.87		+ 30.00		+ 33.75			+ 33.75	
21	42.45		42.12	21	40.54		40.53	21	44.05		44.52		21	44.52	
+59	1	5.90	6.23	1	7.81		7.82	1	4.30		3.83		1	3.83	
−16	40	53	40	12	40	40	39	59	40	52	40	55	40	55	
	1.23695		1.23660		1.23685		1.23660		1.23695				1.23695		
	+2976		+2976		+715		+715		+158				+3400		
	1.26671		1.26636		+725		+725		1.23853				1.27095		
	+18.48		+18.47		1.24410		1.24375		+17.32				+18.66		
	− .43		− .08		+17.54		+17.53								
	− .19		− .30		− .12		− .37		− .46				− .58		
	+ .05		+ .08		− .21		− .36		− .20				− .23		
					+ .06		+ .08		+ .05				+ .05		
	+17.91		+18.17		+17.24		+16.88		+16.71				+17.90		
+59	1	23.81	24.40	1	25.05		24.70	1	21.01				1	21.73	
	1	24.10	+2 6.03	1	24.88	+2	6.73			+2	8.87			+2	8.44
	3	29.7	+0.8	3	30.0		+0.8	3	30.1		+0.8	3	30.6		+0.7
	+2	5.6	−+20.5	+2	5.1		−+20.8	+2	9.1		−+20.9	+2	8.9		−+20.4
		6.1	+1 46.33		5.6	+1	46.73		9.6	+1	48.77		9.4	+1	48.74
	59		+3 10.43			+3	11.61			+3	9.78			+3	10.47

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50 Cephei H

h m s
4 37 2
+ 80° 57'
- 38° 28'

log cos δ 9.20145
log cos sin z 9.32640

tang δ +6.28' +6.32
sin z -.62

1876

Feb. 22				Feb. 23				Feb. 29
	+.01				+.01			-.08
35	11.4	35	24.6	36	38.0	36	16.1	Ch. J.
	21.0		~~38.0~~		46.9		22.5	
	29.0		~~30.7~~		59.3		29.6	
			12.0				37.0	
			23.8				43.0	
			30.0				49.5	
			37.3				56.2	
			43.0				3.0	
			48.7				10.1	
			57.0					
			3.7					
			9.9					
			27.14				26.69	
35	20.47		39.14	36	48.07		38.69	
		35	43.489			36	42.989	
		36						
	+31.86				+31.71			
	+.06				+.06		-.50	
	-1.37 43				-1.27 31			
	+30.23 29.99				+30.50 46			
37	13.52 48				13.45			

11h 37m 13.465

	+23.02		+.06				+.06			-.50	
	1.36211		1.91918								
	0.68851		1.24558								
			-5.08		-5.08						
					0.70586						
					0,03226						
	°	'									
	25	0	25	1	25	0	25	1	25	0	25	0
	"	"										
	56.0	7.4	18.9	29.9	41.4	50.9	21.9	29.7	13.0	14.8	45.2	47.8
	5.2	0.2	28.7	24.1	48.9	44.3	28.7	24.1	19.1	18.6	51.2	47.0
	12.12	7.6	47.6	14.0	10.3	9.52	10.6	13.8	12.1	8.4	9.64	14.8
	0.60	3.80	23.50	27.10	45.15	47.60	25.30	26.90	16.05	14.20	48.20	47.40
	'	"	'	"	'	"	'	"	'	"	'	"
	26	2.20	26	25.40	25	46.37	26	26.10	25	15.12	25	47.80
	~~4.88~~		+17.60	~~+18~~	—	1.08		~~-.08~~				
	~~26 7.08~~		~~26 17.50~~		25	45.29	~~26 25.02~~		O.K			
	26 19.80											
+80	~~26~~		~~56 18.07~~		~~87~~	~~3.06~~	~~56 23.33~~		O.K			
	56 28.55				~~57~~	~~3.06~~						
-38	36	04			~~36~~	~~20~~						
					36	20						
	1.66220				1.66220							
	+2007				+4010							
	1.68227				1.70230							
	+48.11				+50.38							
	- .59				- .00							
	- .15				- .19							
	+ .04				+ .06							
	+47.41				+50.25							
+80	57 15.96				57 ~~52.31~~							
			+2 6.02		13.58		+2 5.45			+2 6.03		
			+1.6				+1.6			+1.6		
			-27.6				-27.6					
			+1 40.02				+1 39.45					
			80 58 55.98				58 ~~32.76~~ 53.03					

+80° 59' ~~31.97~~ 54.50

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Polaris
h m s
1 12 59
+88° 38' 34"

	N.A. m s
α_0	13 42.205
$\frac{d\alpha}{dt}$	+ 21.173
δ_0	39 11.88
$\frac{d\delta}{dt}$	+ 19.02

1877

M.C. −.40
Jan 2.2

M.C. −.25
Jan 4

12 22.90 | 12 11.38

+1	22.89	13	28.92	13	26.96
~~−2.48~~		−	66.02	−	~~75.58~~
−19.10		−	65.85	−	75.41
+	13.28				
+1	19.07				
13	41.97				

+1	25.85	13	26.96		
~~−2.55~~		−	~~75.58~~		
−10.68		−	75.41		
+15.25					
+1	30.42				
13	41.80				
−2.48				−1.55	

48 13.11 | 48 14.22

+88	34 35.24	34 34.13	
−46	15 38		
	1.77890	1.77890	
	+ 2808	+ 3628	
	1.80698	1.81518	
	+ 6412	+ 6534	
	− .96	− .96	
	+ 13	+ 13	
	+1 329	+1 4.51	
	35 38.53	35 38.64	
	+3 56.74	13 56.72	
	39 36.9 + 1.9	39 37.1 + 1.9	
	+3 58.4 − 25.0	+3 58.5 − 25.2	
	58.5 +3 33.64	58.6 +3 33.42	
	39 12.19	39 12.06	

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