

KG
11366
v.697

*Inclination of
Declination Wires.*

1877 —

Charles W. Sever, University Bookstore, Cambridge.

Observations
for Inclination
of Declination Wire.

1877phae.proj.1701M

Reader. J. F. M.

1877phae.proj.178

Oct. 25 1876

η Cephei $20^h 42^m$

$\delta = +61^\circ 22'$

$\cos \delta = 9.68052$

0.86661

$\log 15 = 1.17609$

T_x	T_y	T_z	$T - T_z$	Circle Readings	$\log x_1$	$\log x_2$	$\log \tan i$	i	
42	15.6	20 41 [19.7 22.5 23.7]	41 32.6	+78.6	4 15.40	$x_1 = 166.2$	2.22063	3.07724	8.94753 5° 3' 52"
19.8					4 50.58	$x_2 = 105.87$		2.02477	
24.1		42 [13.0 16.7 20.1]	42 16.6	+24.6					
32.5					5 26.57	$x_1 = 84.6$	1.73719	2.59350	8.96284 6° 14' 38"
36.7		43 [7.3 11.0 15.3]	43 11.2	-30.0		$x_2 = 36.02$		1.55654	
41.0					6 1.27				
45.7		44 8.8	44 8.8	-87.6					
49.9									
53.5									
57									
6.9									
42	41.16								

Oct. 25-1876 γ Draconis J. F. M. $\delta = +82^\circ 4'$ $\cos \delta = 9.13994$ 0.31603
 $\log 15 = 1.17609$

$\frac{1}{2}$

T_x	T_y	T_z	$T - T_z$	Circle Readings	$\log x_1$	$\log x_2$	$\log \tan i$	i									
20	50	50.9	20	49 [38.8 52.0 57]	49	52.2	+88.5	22	34.67	$x_1 = 344.0$	2.53656	2.85259	8.90745	4	37	12	
		57.9								$y_1 = 57.55$		1.76004					
		5.8		50	[43.6 49.6]	50	46.6	+34.1	22	44.47							
		18.0		51	[48.0 56.5 91]	51	57.9	-37.2	22	58.25	$x_2 = 208.6$	2.31931	2.63534	8.92636	4	49	28
		20.9								$y_2 = 31.45$		1.56170					
		28.1							23	6.25	$x_1 = 125.7$						
		35.3		52	[33.5 45.7 53.4]	52	44.9	-84.2			$y_3 = 23.58$						
		43.6		54	[4.0 13.6 27.9]	54	15.2	-174.5	23	26.92	$x_2 = 171.3$						
		50.5									$y_4 = 25.97$						
51	20.667			53	[22.9 36.0 49.8]	53	36.2	-253.5	23	32.22							

Rej. Not symmetric.

Oct. 25-1876 γ Draconis J. F. M. $\delta = +77^\circ 38'$ $\cos \delta = 9.33075$ 0.50684
 $\log 15 = 1.17609$

21	7	32.7	21	4	[59.0 82 125]	5	6.6	+165.2	48	41.85	$x'_1 = 272.9$	2.43600	2.94284	8.95324	5	7	52
		37.4									$y_1 = 78.72$		1.89608				
		42.2		5	[59.4 6.1 16.6]	6	7.4	+104.4	49	1.25							
		46.9															
		52.0		7	[6.0 13.5 23.9]	7	14.5	+37.3	49	21.87							
		56.6															
		13		8	[30.7 36.6 40.8]	8	36.5	-44.7	49	44.62	$x_2 = 149.1$	2.17348	2.68032	8.95687	5	10	26
		60									$y_2 = 43.37$		1.63719				
		10.7		9	[35.5 38.2 44.8]	9	39.5	-107.7	50	0.37							
7		51.56															

Oct. 25-1876 η Cephei J. F. M. $\delta = +80^\circ 1'$ $\cos \delta = 9.23895$ 0.41504
 $\log 15 = 1.17609$

h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h </
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Oct. 25 1876 226 β Cephei J. T. Mo. $\delta = +75^\circ 35'$ $\cos \delta = 9.39615$ 0.57220
 1.17609

T_r			T_s			T_P		$T_P - T_r$	Circle	$\log x, x_2$	$\log$	$\log \tan i$	i				
h	m	s	h	m	s	m	s		Readings								
22	29	133	22	29	[0.9 1.9 4.9]	29	2.6	+60.5	51	14.75	$x_1 = 124.0$	2.09342	2.66566	8.93986	4	58	34
		218									$x_2 = 40.32$		1.60552				
		30.1		30	[8.7 9.5 17.8]	30	10.3	-7.2	51	35.95							
		46.1															
		54.7		30	[58.1 6.3 16.5]	31	6.6	-63.5	51	55.07							
		8.1															
		11.8															
		19.4															
		36.0															
		44.3															
		53.0															

30 3.082

Oct. 29 - 1876 β Cephei J. T. Mo. $\delta = +70^\circ 1'$ $\cos \delta = 9.53370$ 0.70979
 1.17609

h	m	s	h	m	s	m	s	x_1	x_2	$\log$	$\log \tan i$	i					
21	26	44.3	21	25	[3.4 10.4 14.7]	25	10.2	+109.2	19	55.45	$x_1 = 211.7$ $x_2 = 96.42$	2.32572	3.03551	8.94866	5	4	39
		47.7											1.98417				
		50.4		26	[11.9 15.8 21.0]	26	16.2	+43.2	20	27.95							
		63.2															
		76.4		27	[23.7 31.1 37.0]	27	31.1	-31.7	21	25.2	$x_1 = 74.9$ $x_2 = 34.57$	1.87448	2.58427	8.95443	5	8	42
		89.3											1.53870				
		2.3		28	[36.0 42.1 47.5]	28	41.9	-102.5	21	31.87							
		5.3															
		8.4															

26 59.367

Oct. 29 - 1876 β Cephei J. T. Mo. $\delta = +73^\circ 0'$ $\cos \delta = 9.46593$ 0.64202
 1.17609

h	m	s	h	m	s	s	m	s	x_1	x_2	$\log$	$\log \tan i$	i						
22	32	23.0	22	31	[4.5	11.6	16.2]	31	10.8	+86.2	26	13.42	$x_1 = 162.6$ $x_2 = 63.00$	2.21112	2.85314	8.94620	5	2	56
		26.6													1.99934				
		30.2		32	[0.7	4.9	7.6]	32	4.4	+32.6	26	35.47							
		33.1																	
		36.4		32	[58.9	8.8	11.0]	33	4.6	-27.6	26	39.35	$x_1 = 6.02$ $x_2 = 23.88$	1.77960	2.42162	8.95641	5	10	6
		40.8													1.37803				
		44.3		33	[48.0	58.7	58.5]	33	53.4	-76.4	27	16.42							
		47.7																	
		51.1																	

32 37.022

Oct. 29 1876 ϵ Cephei J. T. Mo. $\delta = +65^\circ 33'$ $\cos \delta = 9.61689$ 0.79298
 1.17609

h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s
22	45	0.9	22	43	[38.0 42.3 47.1]	43	42.5	+88.3	52	51.72	$x_1 = 174.1$ $x_2 = 95.18$	2.24080	3.03398	8.94477	5	1	57			
		3.5											1.97855							
		6.9		44	[15.0 17.8 21.6]	44	18.1	+52.7	53	11.45										
		8.4																		
		10.8		46	[0.1 4.7 9.7]	46	4.8	-54.0	54	11.02	$x_1 = 106.7$ $x_2 = 59.57$	2.02816	2.82114	8.95389	5	8	19			
		13.4											1.77503							
		15.7		46	[32.4 35.8 41.0]	46	36.6	-85.8	54	26.90										
		18.2																		
		20.8																		

45 10.844

Oct. 29 1876 π Cephei J. T. Mo.

Oct. 29 - 1876 π Cephei f. J. M. $\delta = +74^\circ 43'$ $\cos \delta = 9.42093$ 0.59702
 1.17609

T_2	T_1	$T_2 - T_1$	Circle Readings	$\log x_1, x_2$	$\log$	$\log \tan i$	i
23 3 27.7	23 2 [23.4 22.9 23.0]	2 30.1 +83.3	43 17.20	$x_1 = 171.1$ $y_1 = 59.27$	2.23325	2.83027	8.94256 5 0 25
41.6	3 [3.2 2.8 16.0]	3 9.3 +44.1	43 31.17			1.77288	
43.6							
49.3	4 [3.0 2.7 42.2]	4 36.6 -43.2	44 2.22	$x_2 = 87.3$ $y_2 = 31.05$	1.94101	2.53803	8.95403 5 8 25
53.4	5 [14.9 20.7 28.1]	5 21.2 -87.8	44 16.47			1.49206	
57.3							
59.1							
8.9							
3 53.378							

Oct. 29 - 1876 γ Cephei f. J. M. $\delta = +76^\circ 57'$ $\cos \delta = 9.35373$ 0.52982
 1.17609

23 23 53.8	23 21 [21.6 20.8 40.4]	31 32.3 +161.6	29 35.37	$x = 326.8$ $y = 97.88$	2.51428	3.04410	8.94657 5 3 12
0.3	32 [12.8 22.0 30.5]	32 21.8 +112.1	29 52.30			1.99069	
4.6	33 [4.7 12.5 19.9]	33 12.4 +61.5	30 8.55	$x_2 = 222.0$ $y_2 = 69.10$	2.34635	2.87617	8.95055 5 5 58
9.4	35 [3.3 10.3 18.6]	35 10.7 -56.8	30 43.35	$x_3 = 168.9$ $y_3 = 51.05$	2.22743	2.75745	8.95054 5 5 57
13.9	35 [13.9 3.0 12.5]	36 3.8 -109.9	30 59.40	$x_4 = 171.4$ $y_4 = 50.85$	2.23401	2.76383	8.94246 5 0 21
18.1	36 [5.0 3.2 9.0]	36 39.1 -165.2	31 13.25			1.70629	
22.1							
27.4							
32.1							
34 13.856							

Oct. 29 - 1876 δ H Cephei f. J. M. $\delta = +67^\circ 7'$ $\cos \delta = 9.58979$ 0.76588
 1.17609

23 41 45.0	23 40 [20.0 24.2 28.4]	40 24.2 +91.4	18 44.65	$x = 183.3$ $y_1 = 95.42$	2.26316	3.02904	8.95060 5 6 0
47.6	40 [34.0 37.9 23]	40 58.1 +59.5	19 3.65			1.97964	
50.1	42 [45.9 50.0 34.6]	42 50.2 -54.6	20 2.40	$x_2 = 112.1$ $y_2 = 58.75$	2.04961	2.81549	8.95352 5 8 3
53.1	43 [22.2 27.2 33.0]	43 27.5 -91.9	20 20.7			1.76901	
55.7							
58.3							
1.0							
3.6							
6.1							
41 55.611							

Oct. 30 - 1876 31 Cephei J. F. Mo. $\delta = +73^{\circ} 0'$ $\cos \delta = 9.46593$ 0.64202

T_x	T_y	T_P	$T_P - T_0$	Circle Readings	$\log x_1$	$\log x_2$	$\log \tan i$	i
h m s	h m s	m s	s					$^{\circ}$ $'$ $''$
22 32 17.7	22 31 [177 214 251]	31 21.4	+70.5	26 20.62 $x = 149.3$	2.17406	2.81608	8.95130	5 6 30
21.3				$y_1 = 58.53$		1.76738		
24.9	31 [42.6 477 537]	31 48.0	+43.9	26 31.72				
28.7								
32.1	33 [5.3 11.4 16.3]	33 11.1	-39.2	27 4.65 $x = 83.1$	1.91960	2.56162	8.95594	5 9 47
35.4				$y_2 = 32.93$		1.51759		
38.7	33 [44.7 50.0 57.3]	33 50.7	-78.8	27 19.15				
42.6								
46.1								

32 31.944

Oct. 30 1876 31 Cephei J. F. Mo. $\delta = +65^{\circ} 33'$ $\cos \delta = 9.61689$ 0.79298

h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s
22 44 57.6	22 43 [36.6 41.1 44.7]	43 40.8	+86.5	52 53.22 $x = 142.4$	2.15351	2.94649	8.96119	5 13 31
0.0				$y_1 = 80.85$		1.90768		
2.4	45 [58.9 35 7.1]	46 3.2	-55.9	54 14.07				
5.0								
7.4								
9.7								
12.0								
14.6								
17.3								

45 7.333

Oct. 30 1876 31 Cephei J. F. Mo. $\delta = +74^{\circ} 43'$ $\cos \delta = 9.42093$ 0.59702

h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s
23 3 31.9	23 1 [25.8 34.7 39.0]	1 33.2	+134.3	42 59.05 $x = 269.3$	2.43024	3.02726	8.94285	5 0 37
35.8				$y_1 = 93.35$		1.97011		
39.6	2 [13.1 12.7 25.7]	2 19.5	+88.0	43 16.20				
43.7								
47.6	2 [39.7 5.0 10.1]	3 4.9	+42.6	43 31.90 $x = 175.9$	2.24527	2.84229	8.94247	5 0 22
51.5				$y_2 = 60.92$		1.78476		
55.0	4 [26.0 30.6 36.2]	4 30.9	-43.4	44 3.10				
58.2								
34	5 [8.7 16.4 21.1]	5 15.4	-89.9	44 17.12 $x = 86.0$	1.93450	2.53152	8.96263	5 14 33
				$y_3 = 31.20$		1.49415		
3 47.522	5 [34.9 28 9.9]	6 2.5	-135.0	44 32.40				

Oct. 31 1876 31 Cephei J. F. Mo. $\delta = +73^{\circ} 0'$ $\cos \delta = 9.46593$ 0.64202

h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s
22 32 16.8	22 30 [30.6 35.4 42.4]	30 36.1	+114.8	26 0.57 $x = 243.0$	2.38561	3.02763	8.94029	4 58 52
20.4				$y_1 = 92.88$		1.76792		
23.9	31 [6.6 12.3 17.7]	31 12.2	+78.4	26 16.12				
27.2								
30.8	31 [37.0 2.7 8.2]	32 2.6	+28.3	26 35.80 $x = 160.8$	2.20629	2.84831	8.94148	4 59 41
34.1				$y_2 = 61.63$		1.78979		
38.0	32 [53.4 58.7 39]	32 58.7	-27.8	26 58.02				
41.5								
45.1	33 [47.8 53.0 58.2]	33 53.0	-82.1	27 17.75 $x = 56.1$	1.74896	2.39098	8.95576	5 9 38
				$y_3 = 22.22$		1.34674		
32 30.867	34 [34.2 38.9 44.2]	34 39.1	-128.2	27 33.45				

Oct. 31 1876 31 Cephei J. F. Mo. $\delta = +65^{\circ} 33'$ $\cos \delta = 9.61689$ 0.79298

h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s	h m s
22 44 56.2	22 43 [35.0 38.6 42.7]	43 38.8	+87.4	52 52.12 $x = 176.6$	2.24699	3.03997	8.94501	5 2 7
58.7				$y_1 = 94.60$		1.98498		
1.3	44 [8.4 12.0 16.8]	44 12.4	+53.8	53 12.07				
3.6								
6.3	45 [52.8 57.0 3.0]	45 57.6	-51.4	54 11.95 $x = 105.2$	2.02202	2.81500	8.96228	5 14 18
8.7				$y_2 = 59.88$		1.77728		
11.2	46 [31.0 35.8 39.5]	46 35.4	-89.2	54 28.72				
13.6								
16.2								
45 6.200								

Nov. 4 - 1876 76 Draconis f. J. No. $\delta = +82.4$ $\cos \delta = 9.13994$ 0.31603
 1.17609

T_r	T_d	T_d	$T_d - T_r$	Circle Reading	$\log x, x$	$\log$	$\log tang$	i
h m s	h m s	h m s	m s					
20 30 425	20 48 [32.7 42.5 46.3]	48 43.9 + 149.2	22 26.52 $x = 320.8$	22 26.52	3.50623	2.82226	8.94136	4 59 36
506			$y = 58.6$			1.76462		
581	49 [196 300 41.8]	49 30.5 + 112.6	22 35.95	22 35.95				
5.9								
132	57 [1.0 100 24.5]	57 11.8 + 1.3	22 54.82	22 54.82				
20.2								
28.1	52 [456 58.1 10.2]	52 58.0 - 104.9	23 14.05 $x = 207.6$	23 14.05	2.31702	2.63305	8.94788	5 4 6
360			$y = 38.10$			1.58093		
434	53 [494 4.0 20.8]	54 4.7 - 171.6	23 24.68	23 24.68				

51 13.111

Nov. 4 - 1876 π Cephei f. J. No. $\delta = 174.43$ $\cos \delta = 9.42093$ 0.59702
 1.17609

T_r	T_d	T_d	$T_d - T_r$	Circle Reading	$\log x, x$	$\log$	$\log tang$	i
h m s	h m s	h m s	m s					
23 3 340	23 2 [9.0 14.2 19.6]	2 14.3 + 95.5	43 13.30 $x = 219.9$	43 13.30	2.34223	1.80564	8.6629	
37.8			$y = 63.92$			2.93925	3.261	
41.9	2 [363 14 5.9]	3 1.2 + 48.6	43 30.40	43 30.40				
45.6								
49.7	4 [330 38.8 4.0]	4 38.9 - 69.1	44 5.80 $x = 117.7$	44 5.80	2.07078	1.54900		
52.8			$y = 35.40$			2.66780		
57.7	5 [1.4 10.2 20.0]	5 14.2 - 12.4	44 17.22	44 17.22				
6.0								

Nov. 4 - 1876 41 H Cassiope f. J. No. $\delta = +67.7$ $\cos \delta = 9.58979$ 0.76588
 1.17609

T_r	T_d	T_d	$T_d - T_r$	Circle Reading	$\log x, x$	$\log$	$\log tang$	i
h m s	h m s	h m s	m s					
23 41 415	23 40 [14.0 18.0 23.1]	40 18.4 + 93.5	18 14.00 $x = 192.1$	18 14.00	2.28353	1.49441	8.95038	5 5 51
43.8			$y = 49.95$			1.99978		
46.5	40 [505 53.5 57.0]	40 53.7 + 58.2	19 4.50	19 4.50				
49.3								
51.7	42 [48.2 53.7 57.2]	42 53.0 - 61.1	50 5.42 $x = 119.3$	50 5.42	2.07664	1.84252	8.94224	5 0 12
54.5			$y = 60.92$			1.78476		
57.2	43 [24.4 30.0 37.2]	43 30.5 - 98.6	20 23.95	20 23.95				
59.8								
2.4								

41 51.856

Nov. 12 1876 77 Draconis f. J. No. $\delta = +77.38$ $\cos \delta = 9.33075$ 0.50684
 1.17609

T_r	T_d	T_d	$T_d - T_r$	Circle Reading	$\log x, x$	$\log$	$\log tang$	i
h m s	h m s	h m s	m s					
21 7 197	21 5 [12.3 19.0 28.8]	5 26.0 + 139.1	47 53.90 $x =$	47 53.90				
230			$y =$					
295	5 [57.7 57.3 6.0]	5 58.3 + 102.8	48 6.18	48 6.18				
345								
390	6 [52.3 0.6 7.0]	7 5.0 + 39.1	48 24.60 $x =$	48 24.60				
43.7			$y =$					
48.9	8 [14.0 21.0 30.0]	8 21.7 - 42.6	48 48.10	48 48.10				
53.7								
58.0	9 [23.4 31.0 40.8]	9 31.7 - 112.6	50 6.90	50 6.90				
7 39.111	10 [30.9 37.2 46.3]	10 38.1 - 179.0						

Rj. Marked? in records.

Nov. 13 - 1876 77 Draconis f. J. No. $\delta = +77.38$ $\cos \delta = 9.33075$ 0.50684
 1.17609

T_r	T_d	T_d	$T_d - T_r$	Circle Reading	$\log x, x$	$\log$	$\log tang$	i
h m s	h m s	h m s	m s					
21 7 190	21 4 [44.0 57.4 59.1]	4 51.5 + 164.8	48 44.90 $x = 345.9$	48 44.90	2.53896	3.04579	8.94927	5 5 4
240			$y = 98.87$			1.99506		
28.6	5 [42.6 60.5 57.0]	5 50.7 + 107.6	49 3.85	49 3.85				
33.5								
38.2	6 [26.0 31.8 40.0]	6 32.6 + 65.7	49 16.52 $x = 220.8$	49 16.52	2.34405	2.85084	8.94898	5 4 52
43.3			$y = 63.07$			1.79982		
48.1	8 [36.0 44.6 53.4]	8 45.3 - 67.0	49 57.07	49 57.07				
52.8								
57.6	9 [22.9 30.6 41.0]	9 31.5 - 113.2	50 6.92 $x = 182.7$	50 6.92	2.12287	2.62971	8.97828	5 26 2
			$y = 40.55$			1.60799		
7 38.344	10 [28.0 37.4 46.8]	10 37.4 - 179.0	50 23.77	50 23.77				

Nov. 13 - 1876 β Cephei J. F. No. $\delta = +70^\circ 1'$ $\cos \delta = \frac{9.53370}{1.17609} 0.70979$

T_r			T_s			T_p		$T_p - T_s$		Circle Readings	$\log x, x$	$\log$	$\log \tan i$	i
h	m	s	h	m	s	m	s	s	s					
21	26	34.8	21	24	[52.6 57.6 2.3]	24	57.5	+109.2		24 59.85 $x_1 = 215.5$	2.33345	3.84324	8.94884	5 4 48
		37.7								$y_1 = 98.20$		1.99211		
		40.7		25	[36.0 40.7 45.0]	25	40.6	+66.1		25 16.32				
		43.6												
		46.7		27	[45.2 52.4 58.0]	27	51.9	-65.2		26 15.98 $x_2 = 131.3$	2.11826	2.82805	8.94763	5 3 56
		48.8								$y_2 = 59.66$		1.77568		
		52.7		28	[27.5 32.5 38.8]	28	32.9	-106.2		26 33.05				
		53.7												
		58.4												

26 46.711

Dec. 4 - 1876 γ Cephei J. F. No. $\delta = +76^\circ 57'$ $\cos \delta = \frac{9.35373}{1.17609} 0.52982$

23	33	24.7	23	31	[5.0 41.0 5]	31	41.0	+121.8	29	43.82	$x = 263.3$	2.42045	2.95027	8.94769	5 3 58
		25.3									$y = 79.06$	1.89796			
		33.5		32	[17.9 26.0 32.5]	32	25.5	+77.3	29	58.45					
		38.0													
		43.0		34	[42.4 48.6 58.1]	34	49.7	-66.9	30	42.68	$x_2 = 144.2$	2.15897	2.68879	8.95693	5 10 28
		47.2									$y_2 = 44.23$	1.64572			
		51.9		35	[33.8 2.3 15.0]	36	4.3	-141.5	31	2.88					
		56.4													
		1.0													

Dec. 4 - 1876 δ Cephei J. F. No. $\delta = +67^\circ 7'$ $\cos \delta = \frac{9.58979}{1.17609} 0.76588$

h	m	s	h	m	s	h	m	s	h	m	s
23	41	13.5	23	39	[59.2 3.0 7.4]	40	3.2	+82.9			
		18.0									
		20.8		40	[40.3 45.6 50.0]	40	45.3	+40.8			
		23.4									
		26.0		42	[10.0 14.6 19.7]	42	14.8	-48.7			
		28.4									
		31.6		42	[57.7]	42	57.7	-91.6			
		34.1									
		36.8									

Not in the list - observed.

Dec. 5 - 1876 δ Cephei J. F. No. $\delta = +73^\circ 0'$ $\cos \delta = \frac{9.46593}{1.17609} 0.64202$

h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s
22	31	30.7	22	30	[30.2 34.6 42.2]	30	36.3	+88.6	26	9.78	$x = 200.1$	2.30125	2.94827	8.94754	5	3	52
		54.3									$y = 77.77$		1.89081				
		57.8		30	[38.0 25 8.7]	31	3.1	+61.8	26	22.48							
		1.2															
		4.8		33	[10.7 16.5 22.9]	33	16.7	-71.8	27	12.65	$x_2 = 133.6$	2.12581	2.76788	8.93224	4	53	25
		8.3									$y_2 = 50.13$		1.78910				
		11.9		33	[42.0 56.9 3.2]	33	56.4	-111.5	27	27.58							
		15.7															
		19.0															

32 4.856

Dec. 5 - 1876 ϵ Cephei J. F. No. $\delta = +65^\circ 33'$ $\cos \delta = \frac{9.75258}{1.17609} 0.82284$

22	44	29.9	22	43	[17.4	22.0	26.3]	43	21.9	+78.0	52	56.18	$x = 164.7$	2.21669	3.00967	8.94563	5 23 2
		32.5										$y = 90.22$		1.95530			
		35.0		43	[42.6	46.6	49.6]	43	46.3	+53.6	53	10.28					
		37.4															
		39.8		45	[33.5	36.9	42.3]	45	37.6	-57.7	54	11.68	$x_2 = 111.3$	2.04650	8.3948	8.94869	5 4 40
		42.4										$y_2 = 61.40$		1.78817			
		44.8		46	[1.8	6.1	11.8]	46	6.6	-86.7	54	26.40					
		47.0															
		49.9															

44 39.856

Dec. 7. 1876 221 Corphi 22.7 J. F. M. $\delta = +71^{\circ}43'$ $\cos \delta = \frac{9.49654}{1.17609}$ 0.67263

T_2	T_0	$T_0 - T_2$	Circle Readings	$\log x_1$	$\log x_2$	$\log \tan i$	i
22 6 312 84.3 37.4 41.0 44.0 47.6 50.7 54.0 57.3	22 5 [185 235 298] 5 [576 35 105] 7 [219 266 331] 8 [262 332 391]	5 23.9 + 80.3 6 3.9 + 40.3 7 27.2 - 43.0 8 32.8 - 108.6	42 20.88 42 37.92 43 12.95 43 37.52	$x_1 = 188.9$ $x_2 = 76.64$ $x_1 = 83.3$ $x_2 = 35.83$	2.27623 1.88446 1.92064 1.54444	2.94886 8.93560 2.59327 8.95117	4 55 40 5 6 24

6 44.167

Dec. 19. 1876. 50 Cass- 1-52 J. F. M. $\delta = +71^{\circ}49'$ $\cos \delta = \frac{9.49424}{1.17609}$ 0.67033

1 51 490 52.5 55.8 59.0 2.3 5.3 9.0 12.3 15.5	1 50 [86 136 194] 50 [548 11 6.5] 53 [3.0 9.0 16.9] 53 [498 54.3 59.5]	50 13.9 + 108.4 51 0.8 + 61.5 53 9.6 - 67.3 53 54.5 - 112.4	36 42.80 37 3.20 37 57.30 38 11.40	$x_1 = 220.6$ $x_2 = 88.60$ $x_1 = 128.8$ $x_2 = 54.10$	2.34361 1.941743 2.10992 1.73320	3.01394 8.93349 2.78025 8.95295	4 54 14 5 7 29
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52 2.300

Dec. 19. 1876 48 W. Corphi 2.4 J. F. M. $\delta = +77^{\circ}17'$ $\cos \delta = \frac{9.84268}{1.17609}$ 0.51817

3 3 35.0 4.0 44.5 49.2 54.0 58.7 63 8.1 12.7	3 1 [20.5 27.5 33.6] 2 [39.7 47.2 54.2] 4 [57.0 0.7 9.1] 5 [50.6 0.2 9.3]	1 27.2 + 146.7 2 47.0 + 66.9 4 0.3 - 6.4 5 0.0 - 66.1	9 34.40 10 1.82 10 41.52 10 57.50	$x_1 = 212.8$ $x_2 = 83.10$ $x_1 = 73.3$ $x_2 = 39.70$	2.32797 1.91960 1.86510 1.59879	2.84174 1.91960 2.38387 1.59879	4 54 14 5 7 29
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Ref.
Not-Symmetrical

3 53.944

Dec. 23 1876 J. Corphi 23-34 J. F. M. $\delta = +76^{\circ}57'$ $\cos \delta = \frac{9.35373}{1.17609}$ 0.52982

23 32 53.3 57.7 2.0 7.0 11.4 15.9 20.4 25.4 30.1	23 31 [25.6 32.0 36.9] 32 [1.40 18.8 23.8] 33 [57.9 7.6 17.0] 35 [9.1 16.5 25.1]	31 31.5 + 107.0 32 18.9 + 52.6 34 7.5 - 56.0 35 16.9 - 125.4	29 50.8 30 6.58 30 38.33 30 57.85	$x_1 = 225.4$ $x_2 = 67.77$ $x_1 = 108.6$ $x_2 = 31.75$	2.35295 1.83104 2.03583 1.50174	2.88277 1.83104 2.56565 1.50174	5 4 22 4 56 0
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33 114.67

Dec. 23 1876 41 A Cass 23 41 J. F. M. $\delta = +67^{\circ}7'$ $\cos \delta = \frac{9.58979}{1.17609}$ 0.76588

23 40 44.1 47.8 50.6 53.0 53.8 58.4 1.2 3.7 6.4	23 39 [2.76 30.8 35.2] 39 [57.7 54.8 59.2] 42 [0.2 3.7 8.4] 42 [33.4]	39 31.2 + 84.6 39 55.2 + 60.6 42 4.1 - 68.3 42 33.4 - 97.6	18 42.85 18 56.58 20 3.48 20 18.02	$x_1 = 182.2$ $x_2 = 95.17$ $x_1 = 128.9$ $x_2 = 66.90$	2.26055 1.97850 2.11025 1.82543	3.02643 1.97850 2.87613 1.82543	5 7 2 5 5 6
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40 55.778

Dec. 23-1896 B Mrs. Min 2-57 ⁶ _{an}

Dec. 23-1896 P Mrs. Min ^h 2-57 J. F. M. P. = +74 39 cord = $\frac{9.42278}{1.17609}$ 0.59887

[illegible]

49 55.289 Dec. 24 1876 B Mrs. Min 2-57 J.F.M. $D = +74$ 39 $\cos D = 9.42278$ $\sin D = 0.59887$
 $\begin{matrix} h & m & s \\ 2 & 49 & 38.0 \\ & & 42.0 \\ & & 46.0 \end{matrix}$ $\begin{matrix} h & m & s \\ 2 & 48 & [1.6 \quad 10.8 \quad 17.1] \\ & & 48 [44.7 \quad 50.3 \quad 59.3] \\ & & 51 [\quad 7.8 \quad] \\ & & 51 [42.7 \quad 50.8 \quad 58.8] \end{matrix}$ $\begin{matrix} 48 & 9.8 & +103.8 & 8 & 34.85 & \chi_1 = 22.10 & 2.34439 & 2.94326 & 1.87315 & 89.3989 & 458.25 \end{matrix}$
 $\begin{matrix} 48 & 51.4 & +62.2 & 8 & 19.88 & \chi_1 = 74.67 & & & & & \end{matrix}$
 $\begin{matrix} 51 & 7.8 & -74.2 & 7 & 33.80 & \chi_2 = 13.64 & 2.13481 & 2.73368 & & & \end{matrix}$
 $\begin{matrix} 51 & 50.8 & -117.2 & 7 & 20.18 & \chi_2 = 46.08 & & 1.66351 & 89.2983 & 451.48 \end{matrix}$

49 53.5°

Dec. 27 1876 50 Cass. 1-52ⁿ

Dec. 27 1876 50 Cass. 1-52 J.F.M. $\beta = +71.49$ $\cos \beta = 9.49424$ 0.67033

[illegible]

51 45.867

Dec. 27. 1876 36 H. Cass $2 \frac{1}{2}$ f. F.M.

Dec. 27. 1876 36 No. Cass $2 \frac{1}{2}$ S. F. M. $\beta = +72.16$ $\cos \beta = \frac{9.48371}{11.14862} 0.65980$

[illegible]

25- 11,456

Dec. 27- 1876 B Mrs. Min. ^h 2-57

Dec. 27- 1876 P Mrs. Min. $\frac{4}{2} \frac{1}{51}$ J. F. M. $\rho = +74.39$ $\cos \rho = \frac{942278}{117609}$ 0.59887

[illegible]

49 47.956

Dec. 27-1876 48. H. Cephei $3^h 4^m$ J. F. M. $\delta = +77^\circ 17'$ $\cos \delta = 9.34268$ 0.51871
1.17609

T_2	T_1	$T_1 - T_2$	Circle Readings	$\log x_1$	$\log x_2$	$\log \tan i$	i								
h	m	s	s	s	s	s	s								
3	121	3	1	[28.7 37.3 47.4]	1	37.8 + 119.9	9	43.68	$x_1 = 22.27$	2.34772	2.86649	8.95286	5	4	35
	23.7								$x_2 = 65.97$		1.81935				
	28.0		2	[27.2 32.2 37.9]	2	33.1 + 64.6	10	2.12							
	33.0														
	38.0		4	[19.6 28.6 37.8]	4	28.7 - 51.0	10	35.68	$x_1 = 115.6$	2.06296	2.58173	8.94331	5	0	56
	42.3								$x_2 = 33.50$		1.52504				
	47.1		5	[11.4 19.2 30.8]	5	20.5 - 102.8	10	49.65							
	51.2														
	56.5														

3	37.656	Jan. 2-1877	41 H. Cass	$23^h 41^m$	J. F. M.	$\delta = +67^\circ 7'$	$\cos \delta = 9.58979$	0.76588						
h	m	s	h	m	s	s	s	s						
23	40	27.8	23	39	[24 6.9 11.5]	39	6.9 + 91.6	18 40.18 $x_1 = 182.4$	2.26102	3.02690	8.95456	5	8	47
		30.5						$y_1 = 95.82$		1.98146				
		33.3	39	[33.8 37.6 43.4]	39	38.3 + 60.2	18	57.82						
		35.9												
		38.5	41	[34.4 38.6 44.3]	41	39.1 - 60.6	20	1.92 $x_2 = 120.8$	2.08207	2.84795	8.95891	5	11	53
		41.0						$y_2 = 64.10$		1.80686				
		43.8	42	[5.2 9.1 13.7]	42	9.3 - 90.8	20	16.00						
		46.7												
		49.2												

40 38.522

2	24	48.5	2	23	[7.7 10.6 13.8]	23	12.0 + 110.0	9	27.28	$x_1 = 225.1$	2.35238	2.01218	8.99891	5	4	8
	52.0									$x_2 = 91.22$		1.96009				
	55.2		23	[41.5 47.4 51.2]	23	46.7 + 75.3	9	52.15								
	58.6															
	1.8		26	[9.5 13.5 20.7]	26	14.6 - 72.6	10	43.05	$x_1 = 147.9$	2.16997	1.82977	8.87695	Ref. Mer.?			
	5.4								$x_2 = 50.90$		1.70672					
	8.6		26	[51.0 56.7 3.6]	26	57.1 - 115.1	10	58.50								
	12.2															
	13.4															

25 2.000

Dec. 7	$i = 4^\circ 55' 40''$
" 7	$= 5^\circ 6' 24''$
" 19	$= 4^\circ 54' 14''$
" 19	$= 5^\circ 7' 39''$
" 23	$= 5^\circ 4' 22''$
" 23	$= 4^\circ 56' 0''$
" 23	$= 5^\circ 7' 2''$
" 23	$= 5^\circ 5' 6''$
" 23	$= 5^\circ 1' 45''$
" 23	$= 4^\circ 59' 11''$
" 24	$= 4^\circ 58' 35''$
" 27	$= 5^\circ 2' 54''$
" 27	$= 5^\circ 7' 1''$
" 27	$= 5^\circ 8' 8''$
" 27	$= 5^\circ 8' 26''$
" 27	$= 4^\circ 57' 46''$
" 27	$= 4^\circ 57' 49''$
Mean of $i = 5^\circ 2' 14''$	

Comparison of Results.

Date	Star	R.A.	Coordinate i			Coordinate i		
			$^{\circ}$	$'$	$''$	$^{\circ}$	$'$	$''$
Oct. 25	η Cephei	20.7	53	5	3.9	18	5	14.6
Oct. 25	γ Draconis	21.1	39	5	1.9	21	5	10.4
Oct. 25	β Cephei	22.5				20	4	58.6
Oct. 29	β Cephei	21.4	48	5	4.6	17	5	8.7
Oct. 29	β Cephei	22.5	31	5	2.9	12	5	10.1
Oct. 29	ϵ Cephei	22.7	47	5	2.0	30	5	8.3
Oct. 29	π Cephei	23.1	30	5	0.4	16	5	8.4
Oct. 29	γ Cephei	23.5	48	5	3.2	25	5	6.0
Oct. 29	" "	"	35	5	6.0	25	5	0.3
Oct. 29	δ Cephei	23.7	48	5	6.0	29	5	8.1
Oct. 30	β Cephei	22.5	29	5	6.5	16	5	9.8
Oct. 30	ϵ Cephei	22.7				40	5	13.5
Oct. 30	π Cephei	23.1	47	5	0.6	30	5	0.4
Oct. 30	" "	"				15	5	14.5
Oct. 31	β Cephei	22.5	46	4	58.9	30	4	59.7
Oct. 31	" "	"				11	5	9.6
Oct. 31	ϵ Cephei	22.7	48	5	2.1	30	5	14.3
Nov. 4	γ Draconis	20.8	29	4	59.6	19	5	4.1
Nov. 4	δ Cephei	23.7	50	5	5.8	30	5	0.2
Nov. 13	γ Draconis	21.1	49	5	5.1	31	5	4.9
Nov. 13	β Cephei	21.4	49	5	4.8	30	5	3.9
Dec. 4	γ Cephei	23.5	39	5	3.9	22	5	10.5
Dec. 5	β Cephei	22.5	38	5	3.9	25	4	53.4
Dec. 5	ϵ Cephei	22.7	45	5	2.5	30	5	4.7
Means			42.4	5	3.32	23.9	5	6.31

It is obvious that the inclination is less than the mean value for stars transits at the outer edge of the field. The value which will be adopted is $i = 5^{\circ} 6' 31''$ since nearly all the stars have been observed within the limits from which this value has been obtained. The corrections to be made for stars outside these limits can be calculated.

Mean. 4. 1877 χ' Draconis L. C. $P = +72$ $41 \cos \delta = 9.47371$ 0.64980
 1.17609

η	μ	δ	η	μ	δ	η	μ	δ	Circle Readings	$\log x, y$	$\log$	$\log \tan i$	i
6	23	0.2	6	21	[138 193 234]	21	18.8	+115.2	1 4692 $x = 228.4$ $y = 89.80$	2.35870	3.00850	8.94478	5 1 57
		3.7											
		7.1											
		10.4											
		14.1											
		17.6											
		20.9											
		24.3											
		27.8											
23	14.022												

Mean. 6 - 1877 χ' Draconis L. C. $P = +72$ $41 \cos \delta = 9.47371$ 0.64980
 1.17609

η	μ	δ	η	μ	δ	η	μ	δ	Circle Readings	$\log x, y$	$\log$	$\log \tan i$	i
6	22	59.0	6	21	[92 148 203]	21	14.8	+117.6	1 53.05 $x = 236.1$ $y = 92.23$	2.37310	3.02290	8.94197	5 0 1
23	2.0												
	5.3												
	8.7												
	12.2												
	15.9												
	19.2												
	23.0												
	26.6												
23	12.444												

Mean. 24 - 1877 δ^2 Urs. Majoris

η	μ	δ	η	μ	δ	η	μ	δ
8	59	12.0	8	58	[1.3 6.0 10.9]			
		14.8						
		17.5						
		20.3						
		22.9						
		25.6						
		28.3						
		31.0						
		33.9						

Aug. 11 - 1877 κ Ophiuchi $\delta = +9$ 34 9.88352 1.17609 1.17001

η	μ	δ	η	μ	δ	η	μ	δ	Circle Readings	$\log x, y$	$\log$	$\log \tan i$	i
16	52	7.1	51	49.6	32 30.6				+20.01 53 42.7				
		9.3		51.2	32.3				53 58.5				
		11.4		53.3	33.6				-20.79				
		13.5		51.37	32 32.7				4080				
		15.6											
52	11.38												

Aug. 11 - 1877 κ Ophiuchi $\delta = +2$ 45 9.88980 1.17609 1.17559

η	μ	δ	η	μ	δ	η	μ	δ	Circle Readings	$\log x, y$	$\log$	$\log \tan i$	i
17	42	0.2	41	41.8	42 29.8				+20.59 58 43				
		2.2		43.5	82.7				41 35.8				
		4.3		45.1	34.0				-27.81 53 58.2				
		6.5							42 40.8				
		8.6		41 43.9	42 32.7				4870 64.0				
42	43.6												

Aug. 11 - 1877

17	58	10.6	57	50.5	58	44.9
		13.0		53.1		45.9
		15.4		54.7		47.9
		17.8				
		20.1				

58	15.38	57	52.77	58	45.93
----	-------	----	-------	----	-------

 γ^2 Sagittarii $\delta = -30 \ 25$

50	17.15
51	17.32
	60.19

53.16

9.93569
1.17609

1.11178

1.77938
2.53736~~8.99202~~
8.99202

4 58 49

1.72558

Aug. 11 - 1877

18	1	47.8	1	31.0	2	23.7
		50.0		32.3		25.3
		52.0		34.7		27.3
		54.1				
		56.2				

1	52.02	1	32.67	2	25.43
---	-------	---	-------	---	-------

72 Ophiuchi $\delta = +9 \ 33$

54	11.60
55	21.82
	69.92

52.76

1.72230

9.99394
1.17609

1.17003

1.54460
2.85233
8.95227

5 7 11

Aug. 11 - 1877

18	6	41.0	6	18.7	7	7.2
		43.2		20.1		9.0
		45.5		22.1		11.0
		47.7				
		49.8				

6	45.44	6	20.30	7	9.07
---	-------	---	-------	---	------

 μ Sagittarii $\delta = -21 \ 5$

31	10.18
32	10.25
	61.07

48.77

1.68815

9.96991
1.17609

1.14600

1.78583
2.83415
8.95168

5 6 46

Aug. 11 - 1877

18	18	44.1	18	24.0	19	9.3
		46.2		25.7		11.6
		48.6		27.6		13.5
		50.8				
		53.0				

18	46.54	18	25.77	19	11.47
----	-------	----	-------	----	-------

109 Hercules $\delta = +21 \ 43$

44	15.20
45	14.25
	56.05

45.70

1.65992

9.96803
1.17609

1.14412

1.74558
2.82104
8.94454

5 1 47

Aug. 11, 1877

1	18	28	47.7	28	28.3	29	22.2
			49.9		29.7		24.9
			51.9		31.6		26.3
			54.0				
			56.0				

28	51.50	28	29.87	29	24.43
----	-------	----	-------	----	-------

1 Aquilae $\delta = -8 \ 20$

46	12.02
47	11.00
	63.98

54.56

1.73687

9.99539
1.17609

1.17148

1.80604
2.90835

9.

Aug. 11-1877

 β Lyrae $S = +33 \ 13$

9.92260 10.5869

1.17604

ℓ	m	s	m	s	m	s
18	45	48.9	45	28.0	46	15.4
		51.3		29.8		17.3
		53.7		32.2		20.6
		56.1				
		58.7				

+23.74
-22.23

14	6.05
15	13.85
	66.80

1.82478
2.7

47.57

1.67733

45-52.74

45-30.00

17.57

Preliminary values of P_{Li} for July and August-1877

5 ⁰	6 ¹	11 ¹¹
5	4	2
4	55	49
5	7	11
5	6	90
5	1	47
5 ⁰	4 ¹	12 ¹¹

1877 $\eta = 48'' - 60''$ Inclination of Declination arcs, Jan 14 - Mar. 1

Date	*	S	$\log \cos \delta$	χ	$\log 15 \cos \delta$	η	$\log 15 \cos \delta$	$\log \tan i$	i
Jan. 11	2 Tauri	16 16'	9.98226	46.87		60.12			
22				43.13	1.15835	55.40			
				45.00	1.65321	57.76	1.76163	8.95007	5° 5' 40"
							2.81156		11 20
3	β Orionis	-8 21	9.99537	38.27		53.38			
15				38.63		51.22			
20				38.20		49.83			
Mar. 1				40.93	1.17146	53.75			
				39.008	1.59116	52.045	1.71638	8.95376	5 8 10
									32 40
Jan. 20	β Tauri	28 30	9.94390	44.56	1.64895	52.98	2.76262	8.94522	
Feb. 28				43.50	1.63849	51.68	1.71332	8.95454	
Mar. 1				46.56	1.11999	53.70	1.72977	8.94597	
				44.873	1.65199	53.62	1.72253	8.95835	5 6 0
						52.787	2.77198	8.95053	18 0
Jan. 14	γ Picuum	6 55	9.99683	38.90	1.17292	50.40	1.70243	8.93956	4 58 20
					1.58995		2.76287		4 58 20
13	δ Cassio.	59 35	9.70439	76.64	1.58446	50.85	1.68440	8.94946	
14				79.00	0.88048	53.10	1.72507	8.94678	
				77.82	1.89109	50.725	1.71580	8.94365	
						51.475	2.71157	8.94423	5 1 30
									3 0
13	δ Androm.	48 0	9.82551	68.27		59.60			
14				66.04	1.00160	58.40			
				67.155	1.82708	59.00	1.77085	8.94217	5 0 10
							2.82868		0 20
13	γ Picuum	4 51	9.99844	39.80	1.17453	54.15	1.73360	8.95719	5 12 0
					1.59988		2.77441		12 0
Feb. 3	δ Persei	48 41	9.81969	65.03		55.50			
				51.37	0.99578	45.76			
				58.20	1.76492	50.63	1.70441	8.94371	5 1 10
							2.76070		2 20
3	η "	55 22	9.75459	59.90		45.43			
6				58.64	0.93068	44.60			
				59.27	1.77253	45.015	1.65336	8.94985	5 5 30
							2.70351		11 0
Jan. 23	ϵ "	52 15	9.78691	63.30		50.83			
Feb. 3				75.96		61.70			
6				50.44	0.96800	41.38			
				63.233	1.58094	51.303	1.71014	8.94620	5 3 0
							2.76394		9 0
Jan. 23	β "	40 28	9.88126	47.90		49.38			
Feb. 3				50.53	1.05735	51.30			
				49.215	1.69210	50.34	1.70191	8.95246	5 7 20
							2.74945		14 40
Jan. 20	γ Arietis	20 35	9.97135	48.73		60.63			
23		3 8		46.93		58.42			
30				49.53		61.80			
Feb. 3				48.77		60.07			
4				43.50	1.14744	55.52			
				47.492	1.67662	59.288	1.77297	8.94591	5 4 50
							2.82406		24 10
4	δ Eridani	-9 53	9.99351	39.90		52.23			
10				42.60	1.16960	55.02			
				41.25	1.61542	53.625	1.72937	8.94435	5 1 40
							2.78512		3 20
8	γ Persei	31 31	9.93069	40.97		46.35			
13				50.10	1.10678	56.80			
				45.535	1.65834	51.575	1.71244	8.94732	5 3 40
							2.76512		7 20
Jan. 30	δ Eridani	-7 10	9.99659	42.07		55.48			
Feb. 5				39.57		57.72			
11				45.86		59.80			
13				45.90		60.33			
14				33.63	1.17268	45.60			
				41.406	1.61707	54.626	1.73740	8.94765	5 4 0
							2.78975		20 0

Mean $\eta = 38$) 2032.41
 53.454
 $i = 5^\circ 4' 40''$

$$y = 60'' - 86''$$

Inclination of Declination wires

Jan. 14 - Mar. 1

1877.

Date	*	S	by cos δ	x	by 15 cos δ	y	by 15 cos δ x	by tan i	i
Jan 23	α Beti	3° 36'	9.99914	59.54		77.90			
Pet. 3				57.00	1.17523	78.25			
				58.27	1.76545	76.575	1.88409	8.94341	5° 1' 0"
							2.94068		2' 0"
Jan. 14	α Tauri	16 16	9.98226	60.00		76.56			
Pet. 3				54.20		69.88			
4				55.06		71.86			
5				67.53		86.36			
6				60.27		77.00			
13				61.63		78.05			
20				64.47	1.15835	81.80			
				60.451	1.75141	77.359	1.88551	8.94875	5 4 40
							2.93976		32 40
Jan 30	β "	28 30	9.94390	64.10		74.72			
Pet. 1				61.13		70.13			
4				67.16		77.98			
14				60.23		70.77			
15				62.50		73.36			
21				64.27		78.60			
27				61.20	1.11999	71.60			
				62.956	1.72904	73.457	1.86600	8.94697	5 3 30
							2.91903		24 30
Oct. 1	α Orionid	7 23	9.99638	59.84		77.53			
3				55.83		73.52			
8				52.13		69.67			
14				50.03		66.70			
20				52.27	1.17247	68.72			
				54.02	1.73255	71.228	1.85265	8.94763	5 4 0
							2.90502		20 0
Oct. 27	α Can Min	5 32	9.99797	53.20		71.45			
28				55.83		74.10			
Mar. 1				55.04	1.17406	71.96			
				54.69	1.73791	72.503	1.86036	8.94839	5 4 30
							2.91197		13 30
Oct. 28	β Minim.	28 19	9.94465	62.00		72.93			
Mar. 1				60.34	1.12074	69.98			
				61.17	1.78654	71.455	1.85403	8.94675	5 3 20
							2.90728		6 40
									26) 99 20
									i = 5° 3' 49"
				26) 153640	26) 192538				
						74.053			
				Mean y =					

1877phae. ptoj. 1701M

1877.		Inclination		of Declination		Wires.		Apr. 3 - May 14	
Date	*	δ	$\log \cos \delta$	δ	$\log \sec \delta$	$\log \mu$	$\log \mu$	i	i
Apr. 23	2	Leonis	12° 34'	9.98947	47.93	61.45			
26				45.13	58.72				
May 3				47.26	60.70				
15				32.03	1.16556	41.74			
				43.088	1.63436	55.502	1.74431	8.94439	5° 1' 40" 20' 6' 40"
Apr. 3	0	Hydrae	2 50	9.99947	43.34	1.17556	55.94	1.74772	8.93527
					1.63689			2.81245	4 55 30 4 55 30
26	23	Alb. May	63 36	9.64800	96.47	0.82409	55.72	1.74601	8.93753
					1.98439			2.80848	4 57 0 4 57 0
3	0	Leonis	10 28	9.99271	40.13	1.16880	52.07	1.71659	8.94432
					1.60347			2.77227	5 1 40 5 1 40
3	2	"	24 21	9.95954	45.27	1.13563	53.50	1.72835	8.93691
					1.65581			2.79144	4 56 30 4 56 30
23	π	"	8 39	9.99503	47.40	61.17			
26				42.90	56.72				
May 3				45.67	59.77				
				45.323	1.65632	57.22	1.77247	8.95503	5 9 10 15 27 30
							2.81744		
Apr. 23	λ	Urs. May	43 32	9.86082	48.33	46.68			
26				63.90	1.03641	61.05			
				56.115	1.74908	53.365	1.72726	8.94177	4 59 50 9 59 40
23	μ	"	42 8	9.87016	57.73	1.04625	56.22	1.74989	8.94224
					1.76140		2.80765		5 0 10 5 0 10
15	μ	Hydrae	-16 12	9.98240	43.57	1.15849	54.40	1.73560	8.93792
					1.63919		2.79768		4 57 10 4 57 10
23	42	Leonis	31 20	9.93154	53.23	59.30			
26				43.43	1.10763	48.44			
				48.33	1.68422	53.87	1.73135	8.93950	4 58 20 9 56 40
							2.79185		
22	46	"	34 53	9.91398	50.16	54.98			
23				49.70	1.09007	54.84			
				49.93	1.69806	54.91	1.73965	8.95122	5 6 30 10 13 0
							2.78843		
22	β	Urs. May	57 3	9.73552	77.00	55.93			
23				56.07	39.80	39.80			
May 6				85.67	61.14	61.14			
13				80.63	0.91161	57.94			
				81.10	1.90902	58.337	1.76595	8.94532	5 2 20 15 7 0
							2.82063		
Apr. 23	~	"	62 26	9.66537	72.27	43.37			
May 5				91.67	0.84146	55.23			
				81.97	1.91365	49.30	1.69285	8.93774	4 57 10 9 54 20
							2.75511		
7	χ	Leonis	8 1	9.99574	39.67	1.17183	51.27	1.70986	8.93957
					1.59846		2.77029		4 58 20 4 58 20
Apr. 23	ψ	Urs. May	45 11	9.84809	61.83	59.43			
May 7				45.07	42.32	42.32			
13				66.13	1.02418	60.66			
				57.677	1.76101	54.137	1.73350	8.94831	5 4 20 15 13 0
							2.78519		
Apr. 23	δ	Leonis	21 12	9.96957	49.14	60.80			
26				48.73	60.70	60.70			
May 3				43.77	53.38	53.38			
" 12				49.30	1.14566	60.42			
				47.735	1.67884	58.825	1.76956	8.94506	5 2 10 20 8 40
							2.82450		
3	ν	"	-0 8	0.00000	46.17	61.16			
6				44.70	58.88	58.88			
7				45.44	59.58	59.58			
14				35.97	1.17609	46.08			
				43.07	1.63467	56.425	1.75147	8.94121	4 59 30 18 58 00
							2.81026		
					36)	200010			36) 180 50 50
					mean =	55.558			i = 5° 1' 25"

Inclination of Declination Wires-

Apr. 3-May 14

1877.

Date	*	δ	$\log \cos \delta$	$\log 15 \cos \delta$	$\log \mu$	$\log \mu \cos \delta$	$\log \mu \cos \delta$	i
Apr. 9	α Hydrea	$-8^{\circ} 8'$	9.99561	71.87	95.30			
15				67.40	86.45			
16				67.96	88.88			
22				66.60	87.06			
23				51.07	1.17170	67.44		
				64.98	1.81278	85.026	1.92955	8.94507
							2.98448	5 2 10
16	α Leonis	12 34	9.98947	65.03	1.16556	84.48	1.92675	8.94808
					1.81311		2.97867	5 4 10
26	β "	15 16	9.98440	50.77	64.28			
May 3				54.16	67.28			
5				58.38	72.43			
6				49.67	1.16049	63.80		
				52.596	1.72628	66.948	1.82574	8.93897
				53.245			2.88677	4 58 0 (4) 232
Apr. 9	β Cancri	9 34	9.99392	71.57	1.17001	93.23	1.96956	8.94482
					1.85473		3.02474	5 2 0
9	γ Leonis	48 35	9.80996	79.77	1.03605	76.20	1.88195	8.94406
					1.90184		2.93789	5 1 30
9	δ Cancri	18 37	9.97666	73.20	1.15275	89.96		
15				73.60		92.15		
				73.40	1.86570	91.055	1.95930	8.94085
							3.01845	4 59 10 (4) 118 20
9	ϵ Hydrea	6 53	9.99686	70.84		93.55		
15				71.17	1.17295	93.00		
				71.005	1.85129	93.275	1.96976	8.94552
							3.02424	5 2 30
9	ζ Ursa Maj.	62 26	9.66537	101.40		91.53		
12				139.00		84.97		
15				145.30	0.84146	88.73		
				145.233	2.16207	88.41	1.94650	8.94297
							3.00353	5 0 40
12	θ Hydrea	2 50	9.99947	71.07		94.03		
15				65.10		86.03		
16				66.36	1.17556	87.68		
				67.51	1.82937	89.247	1.95060	8.94567
							3.00493	5 2 30
16	η Leonis	8 59	9.99503	48.50		63.20		
22				65.47	1.17112	85.42		
2				56.985	1.75270	74.31	1.87105	8.94723
							2.92382	5 3 40
9	ζ Ursa Maj.	57 44	9.72743	101.97		71.45		
12				126.77		89.98		
15				115.83	0.90352	81.80		
				114.857	2.06016	81.077	1.90890	8.94522
							2.96368	5 2 20
9	η Leonis	31 20	9.93154	78.60		85.47		
15				80.64		89.84		
22				74.40	1.10763	84.32		
				77.88	1.89143	87.543	1.94222	8.94316
							2.99906	5 0 50

Mean $\mu = 30.1250294$
 83.431

$30 \mid \begin{array}{r} 40 \\ 280 \\ 10 \end{array}$
 $i = 5^{\circ} 1' 20''$

Inclination of Declination Wires, Mar 4-24

$$\gamma = 40'' - 60''$$

Date	α	δ	$\log \cos \delta$	$\log 15 \cos \delta$	$\log \gamma$	$\log 15 \cos \gamma$	$\log \tan i$	i
Mar 6	β Gemini	$28^\circ 19'$	9.94465	52.50	61.47			
7				42.60	48.47			
11				40.20	1.12074	46.18		
				45.10	1.65418	52.04	1.71634	8.94142
							2.77492	$4^\circ 59' 40''$
11	γ	$20 45$	9.97087	38.74	48.55			
20				44.07	1.14696	54.80		
				41.405	1.61706	51.675	1.71328	8.94926
							2.76402	$5^\circ 5' 0''$
4	δ Auriga	$41 6$	9.89712	51.66	57.46			
6				51.17	51.27			
11				47.27	1.05321	48.50		
				50.033	1.69926	50.41	1.70252	8.95005
							2.75247	$5^\circ 5' 40''$
4	ϵ Gemini	$28 3$	9.94573	53.40	61.60			
6				48.64	56.50			
11				38.20	1.12182	44.44		
				46.747	1.66975	54.18	1.73354	8.94227
							2.79157	$5^\circ 0' 10''$
11	ζ Lynx	$43 35$	9.85996	61.10	56.38			
15				52.40	1.03605	50.58		
				56.75	1.75397	53.48	1.72519	8.93817
							2.79002	$4^\circ 57' 20''$
24	δ Cancri	$18 37$	9.97666	45.34	1.15275	55.83	1.74687	8.93764
					1.65648		2.80923	$4^\circ 57' 0''$
24	θ Hydra	$2 50$	9.99947	44.27	1.17556	58.14	1.76448	8.94281
					1.64611		2.82167	$5^\circ 0' 40''$

15/18 50

$$i' = 5^\circ 1' 15''$$

15/79417

$$\text{Mean } \gamma = 52.931$$

$\alpha = 60'' - 82''$

Inclination of Declination Wires -

Mar. 4 - 24

1877.

Date	*	δ	$\log \cos \delta$	$\times$	$\log 15 \cos \delta$	α	$\log \mu$	$\log \cos \delta$	$\log \tan i$	i
Mar. 4	α Orionis	$7^\circ 23'$	9.99638	57.23		76.22				
6				59.815	1.17247	82.37	1.89924	8.94996		
					1.77681	79.295	~~1.90604~~	~~8.95676~~	$5^\circ 5' 30''$	$11' 0''$
							2.74428			
6	α Gemini	$32^\circ 9'$	9.92771	61.10		68.86				
7				56.20		63.47				
11				58.35	1.10380	65.93				
				58.55	1.76753	66.087	1.82012	8.94879	$5^\circ 4' 40''$	$14' 0''$
							2.87133			
4	α Can Min	$5^\circ 32'$	9.99797	56.26		74.15				
6				50.34		66.55				
7				53.50		69.80				
15				48.07		60.65				
20				58.43		77.26				
24				58.04	1.17406	76.15				
				54.107	1.73326	70.76	1.84979	8.94247	$5^\circ 0' 20''$	$2' 0''$
							2.90732			
4	β Gemini	$28^\circ 19'$	9.94465	66.30		77.05				
15				65.77		75.28				
20				62.93		73.90				
24				58.23	1.12074	69.64				
				63.308	1.50140	73.968	1.86905	8.94685	$5^\circ 3' 20''$	$13' 20''$
							2.92220			

 $15 / 40 \quad 20$ $i = 5^\circ 2' 41''$ $15 / 10728$ Mean $\mu = 71.819$

1877. Inclin. of Declination Wires. May 28 - July 4.

Date	*	δ	$\log \cos \delta$	x	$\log \cos \delta$	y	$\log \cos \delta$	$\log \tan i$	i
May 28	α Virginis	$-10^{\circ} 31'$	9.99264	37.27	1.16873	47.45	1.71446	8.94075	$4^{\circ} 59' 10''$
29				43.27	1.60498	56.18	2.77371		$9^{\circ} 58' 20''$
40.27						51.815			
May 17	γ	$0^{\circ} 3'$	0.00000	40.30		53.37			
20				37.57	1.17609	48.95	1.70893	8.94250	$5^{\circ} 0' 20''$
				38.935	1.59034	51.16	2.76643		$10^{\circ} 0' 40''$
May 28	γ Ursa Maj.	$49^{\circ} 56'$	9.80867	55.24		46.85			
29				62.14		52.20			
June 18				57.60		49.73			
20				47.40	0.98476	40.40	1.67482	8.94114	$4^{\circ} 59' 30''$
				56.095	1.74892	47.295	2.73368		$19^{\circ} 58' 0''$
May 29	γ Bootis	$19^{\circ} 1'$	9.97563	43.40		54.30			
30				47.40		57.80			
June 2				44.60		55.00			
4				42.43		53.17			
18				36.17	1.15472	44.55	1.72398	8.94021	$4^{\circ} 58' 50''$
				42.86	1.63205	52.964	2.78377		$24^{\circ} 54' 10''$
May 28	κ Virginis	$9^{\circ} 41'$	9.99377	44.03		56.26			
June 2				42.30		55.26			
18				40.40		51.94			
19				43.60		56.66			
24				47.33	1.16986	61.20	1.75023	8.94156	$4^{\circ} 59' 40''$
				43.532	1.63881	56.264	2.80867		$24^{\circ} 58' 20''$
June 2	ϵ Bootis	$51^{\circ} 57'$	9.78983	76.10		61.35			
27				61.17	0.96592	48.18	1.73858	8.93612	$4^{\circ} 56' 0''$
				68.635	1.83654	54.775	2.80246		$9^{\circ} 52' 0''$
2	θ	$52^{\circ} 26'$	9.78510	72.47		57.80			
4				60.26		48.18			
20				62.96	0.96119	51.20	1.71927	8.94363	$5^{\circ} 1' 10''$
				65.23	1.81445	52.393	2.77564		$15^{\circ} 3' 30''$
14	π	$16^{\circ} 57'$	9.98071	44.10		56.00			
18				43.43		55.45			
20				36.93	1.15680	46.00	1.72002	8.94531	$5^{\circ} 2' 20''$
				41.487	1.61791	52.483	2.77471		$15^{\circ} 7' 0''$
14	β Librae	$-8^{\circ} 55'$	9.99472	36.36		46.27			
18				36.80		48.20			
19				33.10		42.55			
24				47.93		62.70			
27				44.00		57.52			
July 4				45.04	1.17081	57.83	1.72026	8.94159	$4^{\circ} 59' 50''$
				40.538	1.60786	52.512	2.77867		$29^{\circ} 59' 0''$
June 17	β Serpenti	$15^{\circ} 49'$	9.98324	45.77		58.40			
24				46.17	1.15933	58.14	1.76545	8.94365	$5^{\circ} 1' 10''$
				45.97	1.66247	58.27	2.82180		$10^{\circ} 2' 20''$

34) 179706
 Mean $y = 52.855$

34) 169 53 20
 $i = 4^{\circ} 59' 48''$

$\gamma = 60'' - 82''$ Inclination of Declination Wires May 28 - July 4 1877.

Date	*	δ	$\log \cos \delta$	x	$\log \cos \delta$	y	$\log \cos \delta$	$\log \tan i$	i
May 31	2	Virginis	-10 31	9.99264	51.97	67.98			
June 19					50.86	65.08			
					51.415	1.16873	66.53	1.82302	8.94320
								2.87982	5 0 50 10 1 40
May 31	3	"	0 3	0.00000	47.03	61.35			
June 4					49.30	65.03			
18					48.53	63.20			
19					58.67	1.17609	75.95		
					50.882	1.70657	66.382	1.82205	8.92939
								2.88266	4 58 10 19 52 40
17	2	Bortis	19 1	9.97563	57.87	1.15172	73.14	1.86433	8.95016
						1.76245		2.91417	5 5 40 5 5 40
19	2	Virginis	2 9	9.99969	62.50	82.34			
20					58.13	75.76			
27					55.43	1.17578	71.68		
					58.687	1.76854	76.593	1.88419	8.93987
								2.94432	4 58 30 14 55 30
17	11	Bortis	16 57	9.98071	52.13	65.08			
19					57.43	72.55			
24					50.20	1.15680	63.05		
					53.253	1.72634	66.893	1.82538	8.94224
								2.88314	5 0 10 15 0 30

13/90222

Mean $\gamma = 69.402$

13/64 56 0

 $i = 4^{\circ} 59' 42''$

Inclination of Declination Wires. Aug. 6 - Sept. 25

Date	α	δ	$\lg \cos \delta$	χ	$\lg 15 \cos \delta$	η	$\lg 15 \cos \delta$	$\lg \tan i$	i
Aug. 6	2377	57° 0'	9.73611	78.74		56.84			
7				67.50		48.23			
8				58.66	0.91220	42.47			
				68.30	1.83442	49.18	1.69179	8.94517	5° 2' 10"
							2.74662		6' 30"
6	109 Hercules	21 43	9.96803	39.00		47.60			
11				45.74		56.02			
23				41.64	1.14412	51.37			
				42.127	1.62456	51.663	1.71318	8.94450	5 1 50
							2.76868		5 30
27	1 Aquila	-8 20	9.99539	34.96	1.17148				
30				43.93	1.64276	57.60	1.76042	8.94618	5 3 0
							2.81424		3 0
28	B. Delphini	14 10	9.98659	41.33		52.06			
30				36.67	1.16268	46.28			
				39.80	1.59106	49.17	1.69170	8.93796	4 57 20
							2.75374		[9] 54 40
22	"	15 28	9.98398	37.27		47.77			
27				34.90		44.40			
28				41.67	1.16007	52.43			
				37.947	1.57918	48.20	1.68305	8.94380	5 1 20
Sept. 11	Antiquarii	-9 27	9.99407	42.70		54.97			
15				42.40		55.56			
16				44.23		57.65			
22				33.20		44.72			
23				39.36	1.17016	51.02			
				40.378	1.60615	52.782	1.72249	8.94618	5 2 50
							2.77631		14 10
Aug. 16	W. XXXIII 586	-9 27	9.99407	42.86		56.05			
22				44.00		58.73			
27				45.30		59.43			
28				41.83		55.00			
Sept 16				42.13	1.17016	53.00			
				43.224	1.63572	55.842	1.74696	8.94108	4 59 20
							2.80588		[24] 56 40
Aug. 30	"	571 -11 14	9.99160	45.23		58.80			
Sept. 11				43.87		56.37			
12				37.26	1.16769	48.22			
				41.953	1.62276	54.463	1.73610	8.94565	5 2 30
							2.79045		7 30
Aug. 22	"	497 -11 41	9.99071	45.93		60.60			
28				38.46		48.95			
Sept 18				45.93	1.16700	59.05			
				43.44	1.63789	56.20	1.74974	8.94485	5 2 0
							2.80489		6 0
Sept 11	"	427 -9 57	9.99342	40.23		53.82			
12				38.27	1.16951	50.22			
				37.25	1.59384	52.02	1.71617	8.95282	5 7 30
							2.76335		15 0
Aug. 27	"	402 -12 8	9.99079	38.30		51.03			
Sept 18				35.66		45.03			
25				39.04	1.16628	50.55			
				37.667	1.57596	48.87	1.68904	8.94680	5 3 20
							2.74224		10 0
Aug. 28	"	377 -10 43	9.99286	43.57		56.47			
Sept 23				41.36	1.16845	54.00			
				42.465	1.62803	55.235	1.74222	8.94574	5 2 40
							2.79648		5 20

35/183930
Mean $\eta = 52.551$

35/ 68 20
 $i = 50^{\circ} 1' 57''$

Inclination of Declination Wires.

Aug. 6 - Sept. 25

1877.

Date	$\gamma = 60'' - 88''$	δ	$\log \cos \delta$	χ	$\log 15 \cos \delta$	γ	$\log \gamma$	$\log 15 \cos \delta$	$\log \tan i$	i
Aug. 7	K Ophiuchi	9° 34'	9.99592	63.57		83.43				
8				47.26	1.17001	62.90				
				55.415	1.74363	73.165	1.86430	8.95066	5° 6' 0"	12' 0"
							2.91364			
6	ϵ Herculis	31 7	9.93253	60.00		68.00				
7				65.60	1.10862	74.24				
				62.80	1.79796	71.12	1.85199	8.94541	5 2 20	4 40
6	γ Ophiuchi	2 45	9.99950	51.47		67.73	2.80658			
7				49.24		66.00				
8				61.02		81.45				
11				48.67		64.70				
14				54.50	1.17559	73.25				
				52.98	1.72411	70.626	1.84897	8.94927	5 5 0	25 0
							2.89970			
6	ι Aquilae	-8 20	9.99559	50.93		64.80				
11				54.60		71.80				
12				48.83		63.98				
28				54.00	1.17148	70.55				
				52.09	1.71675	67.782	1.83111	8.94288	5 0 40	2 40
							2.88823			
Sept. 18	η Cassiopeiae	57 1	-11 14	48.53		63.68				
23				53.70		68.18				
25				49.36	1.16769	65.22				
				50.53	1.70355	65.693	1.81752	8.94628	5 3 0	9 0
							2.87124			
Aug. 27	"	497	-11 41	64.27		83.30				
Sept. 23				51.87	1.16700	66.67				
				57.82	1.76208	74.985	1.87497	8.94589	5 2 40	5 20
							2.92908			
Aug. 16	"	427	-9 57	46.54	1.16951	69.65	1.84292	8.94558	5 2 30	2 30
					1.66783		2.85734			
Sept. 23	"	402	-12 8	51.40	1.16628	66.22	1.82099	8.94375	5 1 10	1 10
					1.71096		2.87724			
					20/1395.75					
					Mean $\gamma = 69.788$					
									20/62 20	
									$i = 5^\circ 3' 7''$	

Inclination of Declination Wires.

Sept. 30 - Oct. 18

1877phae. proj. 17010

1877.

$\gamma = 40^\circ - 60^\circ$

Inclination of Declination Wires.

Sept. 30 - 6

Date	*	δ	$\log \cos \delta$	χ	$\log 15 \cos \delta$	γ	$\log 15 \cos \delta$	$\log \tan i$	i		
5.7	WXXX 664	-14 52	9.98521	43.40		55.44					
13				37.40	1.16130	46.50					
				40.40	1.60638	50.985	1.70744	8.93976	4 58' 30"	57	" 0
							2.76768				
1				42.57		53.20					
7	" XXII 1261	-12 28	9.98964	37.03	1.16573	47.12					
				39.80	1.59988	51.16	1.70893	8.94332	5 1 0	2	0
							2.76561				
7	" XXIII 57	-12 36	9.98941	40.56		53.20					
13				33.20	1.16550	45.17					
				36.88	1.56679	49.185	1.69184	8.95955	5 12 20	24	40
							2.73229				
13	" 1867	-12 23	9.98978	39.63	1.16587	57.22	1.70944	8.94555	5 2 30	2	30
					1.59802		2.76389				
1	" 228	-12 51	9.98898	45.16		57.78					
7				37.13		49.10					
13				40.60		52.50					
17				40.64		53.14					
18				34.50	1.16507	43.60					
				39.606	1.59776	51.224	1.70947	8.94664	5 3 10	15	50
							2.76283				
Sept 1	Mars Complex	-14 9	9.98662	44.84	1.16271	59.08	1.77144	8.95706	5 10 30	10	30
					1.65167		2.81438				
Oct 1		-11 18	9.99150	44.83		58.65					
13				39.56		53.00					
14				39.80		57.90					
17				46.70	1.16759	60.97					
				42.598	1.62939	56.13	1.74920	8.95222	5 7 10	28	40
							2.79698				
13		-10 40	9.99243	42.13		55.27					
14				39.70		50.86					
17				43.73		56.55					
18				36.26	1.16852	48.18					
				40.455	1.60698	52.59	1.72090	8.94540	5 2 20	9	20
							2.77550				
1		-11 12	9.99165	43.14		56.20					
13				38.50		48.65					
14				45.90		58.43					
17				45.93	1.16774	59.60					
				43.368	1.63717	56.72	1.74601	8.94110	4 59 20	57	20
							2.80491				
13		-10 14	9.99304	36.90	1.16913	48.60	1.68664	8.95048	5 6 0	6	0
					1.56703		2.73616				
7		-9 51	9.99355	42.97	1.16964	55.06	1.74084	8.93803	4 57 20	57	20
					1.63317		2.50281				
Sept. 30		-15 43	9.98345	42.70	1.15954	54.14	1.78352	8.94355	5 1 10	1	10
					1.63043	56.64	2.78997				
						28/148464					
										28/92	20
										$i = 5^\circ 3' 18''$	

Mean $\gamma = 53.023$

$\gamma = 60'' - 70''$

Inclination of Declination Wires.

Sept. 30 - Oct. 18¹⁸⁷⁷

Date	*	δ	$\log \cos \delta$	x	$\log 15 \cos \delta$	γ	$\log 15 \sec \delta$	$\log \tan i$	i
Oct. 17	W 8 ¹¹¹¹	$185^\circ - 12' 23''$		48.67	1.16587 1.68726	65.15	1.81391 2.85313	8.96078	$5^\circ 13' 10''$ $13' 10''$
Sept. 30	Mans Comp	$-14' 9''$		53.26		69.07			
Oct. 7				49.87		64.88			
13				50.74		65.26			
14				47.53		62.53			
17				49.00	1.16271	63.60			
				50.08	1.69966	65.068	1.81337 2.86237	8.95100	$5^\circ 6' 20''$ $31' 40''$
18		$-11' 18''$		52.17	1.16759 1.71742	68.85	1.83790 2.88501	8.95289	$5^\circ 7' 40''$ $7' 40''$
Sept. 30		$-10' 40''$		47.37		62.24			
Oct. 1				48.57		64.58			
7				52.86	1.16852	67.98			
				49.60	1.69548	64.933	1.81247 2.86470	8.94847	$5^\circ 4' 30''$ $13' 30''$
Sept. 30		$-11' 12''$		49.70		64.55			
Oct. 18				48.83	1.16774	62.25			
				49.265	1.69254	63.40	1.80209 2.86028	8.94181	$4^\circ 59' 50''$ $59' 40''$
Sept. 30		$-10' 14''$		51.57		67.37			
Oct. 7				47.30	1.16913	61.27			
				49.435	1.69404	64.32	1.80835 2.86317	8.94518	$5^\circ 2' 10''$ $4' 20''$
Sept. 30		$-9' 51''$		51.74	1.16964 1.71383	68.38	1.83493 2.88347	8.95146	$5^\circ 6' 40''$ $6' 40''$

15) 7796
Mean $\gamma = 65.197$

15) 76 40
 $i = 5^\circ 5' 7''$

15 76 40
28 92 20
20 62 20
35 68 50

98 / 300 10

Adopted value of i for Aug - Oct. 1877 = $5^\circ 3' 4''$

$\log \tan i$ 8.94639
 $\log 15 \tan i$ 0.12248

1877phae.proj. 1701M

1877		$y = 40'' - 60''$		Inclination & Declination Wires				Oct 23 - Dec 31		
Date	*	δ	$\log \cos \delta$	x	$\log 15 \cos \delta$	y	$\log \delta$	$\log \tan i$	i	
Nov. 14	α Cassiope	$+55^\circ 52'$	9.74906	72.30	0.92515 1.85914	54.05	1.73280 2.78429	8.94851	5° 4'	32"
Oct. 30 Dec. 31	ϵ Piscium	$+7^\circ 13'$	9.99655	39.60 42.03 <u>41.82</u>	1.17264 1.61087 <u>53.94</u> 54.10	52.25	1.73320 2.78351	8.94969	5° 5'	22"
Dec. 31	γ Piscium	$+4^\circ 51'$	9.99844	40.57	1.17453 1.60821	54.70	1.73799 2.78274	8.95525	5° 9'	17"
Nov. 14	β Arietis	$+20^\circ 12'$	9.97243	44.60	1.14852 1.64933	56.03	1.74842 2.79785	8.95057	5° 5'	59"
Dec. 26	α Ceti	$-3^\circ 32'$	9.99917	37.30	1.17526 1.57171	49.50	1.69461 2.74697	8.94764	5° 3'	56"
Nov. 14 Dec. 3	ϵ^2 Ceti	$+7^\circ 54'$	9.99586	42.50 46.40 <u>44.45</u>	1.17195 1.64787 <u>59.70</u> 57.40	55.10	1.75891 2.81982	8.93909	4° 58'	2"
Dec. 16	f Yarni	$+12^\circ 31'$	9.98955	41.46	1.16564 1.61763	43.73	1.73022 1.64078 2.78327	8.94695 8.85751	5° 3' 4° 7'	27" 12"
Oct. 6	γ Lacertae	$+49^\circ 39'$	9.81121	54.06	0.98730 1.64704 1.93288	46.27	1.66530 2.63134 2.92018	9.03396 8.94515	6° 10' 5° 2'	18" 12"
Nov. 13 Dec. 1	α Androm	$+41^\circ 40'$	9.87334	53.70 54.70 <u>54.20</u>	1.04943 1.73400 <u>53.67</u> 53.24	52.80	1.72624 2.78343	8.94281	5° 0'	35"
Oct. 30 Nov. 4	γ Piscium	$+2^\circ 36'$	9.99955	42.20 39.47 <u>40.88</u>	1.17584 1.61151 <u>52.15</u> 54.22	56.28	1.73416 2.78715	8.94701	5° 3'	30"

$$\alpha' = 5^\circ 3' 51''$$

Inclination of Declination Wires

Oct 23 - Dec 31 1877

 $\gamma = 60'' - 70''$

Date	*	S	log cos S	χ	log 15 cos S " χ	γ	log γ " 15 cos S	log tan i	i
Nov 14	22 Piscium	+14 42	9.98555	50.73	1.6164 1.70526	65.38	1.81544 2.86686	8.94858	5° 4' 35"
Dec 15	0 Piscium	+8 32	9.99517	50.16	1.17126	65.64	1.81371	8.94784	5° 4' 4"
" 17				48.63	1.69461	64.60	2.86587		
				49.50		65.12			
Dec 15	8 Lictis	+20 12	9.97243	43.80	1.14852 1.64147	76.00	1.88081 2.78999	9.09082	7° 1' 37"
Nov 3	0 Lictis	-3 32	9.99917	46.14	1.17526 1.66408	60.90	1.78462 2.83934	8.94528	5° 2' 18"
Dec 27	8 Eridani	-9 48	9.99362	46.93	1.17971 1.67145	61.97	1.79218 2.85116	8.94102	4° 59' 22"
Dec 1	7 Piscium	+2 36	9.99955	53.92	1.17564	74.90	1.85902	8.95332	5° 7' 55"
Nov 15				51.50	1.73006	69.65	2.90570		
				53.71		72.28			

$$i = 5^{\circ} 3' 39''$$

 $40'' - 60''$ $60'' - 70''$

Jan 14 - Mar 1

Mar 4 - Mar 24

Apr 3 - May 14

May 28 - July 4

Aug 6 - Sept 25

Sept 30 - Oct 18

Oct 23 - Dec 31

5° 4' 40"

5° 1' 15"

5° 1' 25"

4° 59' 48"

5° 1' 57"

5° 3' 18"

5° 3' 51"

5° 3' 49"

5° 2' 41"

5° 1' 20"

4° 59' 42"

5° 3' 7"

5° 3' 4"

5° 3' 39"

5° 4' 14"

5° 1' 58"

5° 1' 20"

4° 59' 45"

5° 2' 32"

5° 3' 11"

5° 3' 45"

5° 4' 14"

5° 1' 58"

5° 1' 41"

4° 59' 45"

5° 2' 32"

5° 3' 11"

5° 3' 9"

Adopted values of i for 1877

1877

Jan 13 - Mar 1

Mar 4 - May 14

May 15 - July 4

July 24 - Dec 31

5° 4' 14"

5° 1' 41"

4° 59' 45"

5° 3' 9"

8.94807

8.94439

8.94159

8.94651

0.12416

0.12048

0.11768

0.12260

1878.

Inclination of Declination Wires.

Jan 1-31.

Date	*	δ	$\log \cos \delta$	x	$\log \sec \delta$ $\log x$	y	$\log y$ $\log \sec \delta$	$\log \tan i$	i
Jan. 5	α Piccium	$+8^{\circ} 32.6$	9.99576	39.83		51.45			
7				41.90		53.30			
13				36.80		48.57			
16				47.66		62.52			
17				44.74		59.90			
19				42.50		57.26			
22				51.83	1.17125	67.87	1.75793	0 1 "	1 "
				43.91	1.63959	57.27	2.81084	8.94709	5 3 30 24 30
1	β Arietis	$+20 12.6$	9.97240	39.97		50.94			
7				58.94		75.28			
13				40.97		50.93			
22				62.03	1.14849	78.38	1.80536		
				50.48	1.70312	63.88	2.85161	8.95375	5 8 10 32 40
13	β Triang.	$+34 24.6$	9.91647	48.13		52.50			
22				51.80	1.09256	56.90	1.72799		
				49.96	1.69862	54.70	2.79118	8.94681	5 3 20 6 40
16	θ Persi	$+48 42.6$	9.81945	56.14		49.62			
23				60.30	0.99554	52.58	1.70842		
				58.22	1.76507	51.10	2.76061	8.94781	5 4 0 8 0
28	α beti	$+3 36.6$	9.99913	45.63	1.17522	60.46	1.78147		
					1.65925		2.83447	8.94700	5 3 30 3 30
16	δ Tauri	$+17 15.3$	9.98000	46.83		59.88			
16				51.66		66.45			
23				44.77		57.98			
29				40.90		50.15			
30				40.20	1.15609	50.63	1.75603		
				44.87	1.65196	57.02	2.80805	8.94798	5 4 10 20 50
1	α Tauri	$+16 16.0$	9.98226	44.40		56.44			
30				41.07	1.15835	53.48	1.74005		
				42.74	1.63083	54.96	2.78918	8.95087	5 6 10 12 20
5	ν Aurigae	$+32 58.3$	9.92374	45.24		50.46			
14				49.88		56.54			
16				43.97	1.09983	49.14	1.71642		
				46.36	1.66614	52.05	2.76597	8.95045	5 5 50 17 30
14	β Tauri	$+28 30.2$	9.94389	39.30		45.90			
23				46.53		53.85			
24				49.56		58.97			
30				47.40	1.11998	57.00	1.73183		
				45.70	1.65992	53.93	2.77990	8.95193	5 7 0 28 0
24	ϵ Orionis	$-1 16.9$	9.99989	42.02	1.59813	54.10	1.72057		
29				39.64	1.17598	52.55	1.72684	8.94646	5 3 10 6 20
				40.84	1.61107	53.32	2.78707	8.93982	4 58 30
							2.77411		
12	α Orionis	$7 23.0$	9.99638	39.10		50.96			
24				38.74		50.92			
30				54.03	1.17247	71.50	1.76185		
				43.96	1.64306	57.79	2.81553	8.94632	5 3 0 9 0
12	γ Umin	$16 30.1$	9.98174	39.23	1.15783	50.43	1.70269		
					1.59362		2.75145	8.95124	5 6 30 6 30

36) 175 50
5° 4' 53"

1878.

Inclination of Declination Wires - Feb. 2-6.

Date	*	δ	$\log \cos \delta$	x	$\log 15 \cos \delta$	y	$\log y$	$\log \tan i$	i
Feb. 2	β Persei	$+40^\circ 24'$	9.88115	82.17		83.55			
3				76.63	1.05724	77.22	1.90515		
				79.40	1.89982	80.38	2.95706	8.94809	$5^\circ 4' 10''$
2	α Hecphai	$+77^\circ 17'$	9.34268	218.66		64.50			
3				163.03		47.58			
4				156.90		46.08			
5				198.71	0.51877	58.55	1.73384		
				184.32	2.26558	54.18	2.78435	8.94949	$5^\circ 5' 10''$
2	δ Persei	$+47^\circ 23'$	9.83055	85.06	1.00664	76.37	1.88292		
					1.92973		2.93637	8.94655	$5^\circ 3' 10''$
2	δ Tauri	$+17^\circ 15.3'$	9.98000	62.36		78.34			
3				58.73		74.67			
4				61.50		77.08			
5				87.36		72.98			
6				47.97	1.15609	60.32	1.86141		
				57.58	1.76027	72.68	2.91636	8.94505	$5^\circ 2' 10''$
2	α Tauri	$+16^\circ 16.0'$	9.98226	61.24	1.15835	78.04	1.89232		
					1.78704		2.94539	8.94693	$5^\circ 3' 30''$
2	ϵ Aurigæ	$+32^\circ 58.3'$	9.92374	65.27		72.18			
4				61.96		69.75			
5				50.83	1.09983	56.95	1.82145		
				59.35	1.77342	66.29	2.87825	8.94820	$5^\circ 4' 20''$
3	ϵ Aurigæ	$+40^\circ 53.7'$	9.87847	80.70		81.40			
4				78.50		78.80			
5				75.17		75.32			
6				62.73	1.05456	62.57	1.87227		
				74.28	1.87087	74.52	2.92543	8.94684	$5^\circ 3' 20''$
3	γ 966	$+74^\circ 57.5'$	9.41417	148.90		58.85			
4				207.10		71.84			
5				111.43		39.50			
6				122.63	0.59026	42.23	1.72509		
				152.52	2.18333	53.10	2.77859	8.95150	$5^\circ 6' 40''$
3	ϵ Orionis	$-1^\circ 16.9'$	9.99989	113.14		68.53			
4				49.90		65.47			
5				56.77		74.34			
6				61.66	1.17598	82.57	1.86171		
				55.37	1.74327	72.73	2.91925	8.94246	$5^\circ 5' 10''$
2	α Orionis	$7^\circ 23.0'$	9.99638	63.50		82.55			
3				51.10		68.08			
4				45.43	1.17247	60.54	1.84751		
				53.34	1.72705	70.39	2.89952	8.94799	$5^\circ 4' 10''$
6	δ 22 H Cam.	$69^\circ 21.6'$	9.54715	143.14	0.72324	68.03	1.83270		
					2.15576		2.87800	8.95370	$5^\circ 8' 10''$
6	γ Gemmi.	$16^\circ 30.1'$	9.98174	42.80	1.15783	54.86	1.73926		
					1.63144		2.78927	8.94999	$5^\circ 5' 30''$

33) 146 20

 $5^\circ 4' 26''$ $5^\circ 4' 53''$ Adopted value Jan 1 - Feb. 6 $i = 5^\circ 4' 40''$ $\log \tan i$ 8.94869
 $\log 15 \tan i$ 0.12478

1878.

Inclination of Declination Wires

Feb. 7 - Mar. 21

Date	*	δ	$\log \cos \delta$	χ	$\log 15 \cos \delta$	χ	$\log \gamma$	$\log \tan i$	i				
Feb. 14	L beta	+13 37	9.99913	66.36	1.82191	85.30	2.99713	8.93382	4 54 30	54 30			
					1.17522								
14	S Persei	+47 24	9.83055	89.76	1.95308	77.05	2.95972	8.92705	4 50 0	50 0			
					1.00664								
11	S Tauri	+17 15	9.98000	65.38		80.08							
14				70.72		86.10							
16				68.84		77.67							
18				66.76		81.25	1.90998						
				66.68	1.82400	81.28	2.98009	8.92989	4 51 50	207 20			
					1.15609								
16	L Aurigae	+32 58	9.92374	69.44		73.45							
18				75.04		79.46	1.88343						
				72.24	1.85878	76.46	2.95861	8.92482	4 48 30	97 0			
					0.09983								
16	B Tauri	+28 30	9.94389	71.02		80.47							
18				65.20		73.16							
19				60.50		67.12							
24				69.48		77.28	1.88745						
26				68.78	1.83746	77.17	2.95744	8.93001	4 51 50	259 10			
28				71.60	1.11998	81.20							
Mar. 4				75.48		85.67							
5				80.42		90.13	1.93283						
				75.83	1.87984	85.67	2.99982	8.93301	4 53 55	161 45			
					1.11998								
Feb. 19	E Orionis	-1 17	9.99989	60.40		76.50							
24				65.88		83.58							
27				67.10		84.90							
28				69.88		88.70	1.92127						
				65.82	1.81836	83.42	2.99426	8.92701	4 49 50	199 20			
					1.17590								
Feb. 11	γ Gemm.	+16 30	9.98174	66.44		80.98							
14				67.78		82.20							
18				66.96		81.70							
19				76.06		92.78							
24				58.14		71.14							
26				72.56		88.20	1.91808						
27				67.38	1.83187	82.81	2.98970	8.92838	4 50 50	355 50			
28				71.78	1.15783	88.25							
Mar. 4				65.80		80.77							
5				68.28		82.80							
16				65.72		79.35							
19				59.96		73.13	1.89170						
21				63.97	1.80598	77.93	2.96381	8.92789	4 50 30	252 30	303-0		
					1.15783								
Feb. 24	E Gemm.	+25 15	9.95638	73.62		85.03							
26				73.14		84.60							
26				74.24		85.32	1.91609						
28				71.31	1.85315	82.43	2.98562	8.93047	4 52 10	208 40			
Mar. 4				79.04	1.13247	90.62							
5				63.94		74.68							
16				53.82		62.37							
19				67.78		77.76	1.88110						
21				66.76	1.82458	76.05	2.95705	8.92405	4 48 0	240 0			
					1.13247								

42) 208 45 136 35

Feb. 7 - Mar. 21 $i = -4^{\circ} 49' 44'' 50' 52''$ $\log \tan i$ 8.92676m $\log 15 \tan i$ 8.10285m

Inclination of Declination Wires.

Mar. 21 - May 8.

1978

1877phae.proj.1701M

Date	*	S	log cos S	x	log 1500 S	y	log y	log tan i	i
Mar. 26	B Comae	9 34	9.99393	70.82		89.05			
30				68.52		84.85			
31				70.80	1.17002	88.28			
				69.88	1.84435	87.39	1.94146	8.92709	4 50 0 150 0
Mar. 26	E Hydrae	6 52	9.99687	43.72		55.25	3.01437		
Apr. 2				66.94		80.88			
3				69.90		88.65			
8				58.10	1.17296	73.66			
				59.66	1.77568	75.86	1.88001	8.93137	4 52 50 211 20
2	K UMa	47 38	9.82855	99.28		85.70	2.94864		
3				87.44		75.68			
8				97.24	1.00464	82.874			
				94.65	1.97612	81.32	1.91073	8.92997	4 51 50 155 30
Mar. 26	E Leonis	24 20	9.95959	72.20		84.30	2.98076		
Apr. 3				72.82		85.05			
13				71.68		83.40			
14				54.26	1.13568	63.33			
				67.74	1.83085	79.02	1.89774	8.93121	4 52 40 210 40
Mar. 30	E Leonis	12 34	9.98948	66.50		82.42	2.96653		
31				65.84		81.42			
Apr. 2				64.24		85.48			
8				62.98		78.42			
13				65.94		81.58			
14				72.80	1.16557	90.14			
				67.22	1.82750	83.24	1.92033	8.92726	4 50 0 300 0
Mar. 30	U UMa	42 7	9.87031	88.48		85.16	2.99307		
31				77.86		73.60			
Apr. 2				97.18		92.70			
3				80.04		73.88			
8				80.22		76.22			
13				83.72		80.28			
14				91.42		87.65			
16				84.80	1.04640	80.75			
				85.46	1.93176	81.28	1.90998	8.93184	4 53 10 425 20
Apr. 8	46 Leonis Min	34 52	9.91404	79.72		83.30	2.97816		
14				74.12		77.63			
16				55.98	1.09013	70.47			
				73.27	1.86493	77.13	1.88722	8.93216	4 53 20 160 0
Mar. 30	S Leonis	21 12	9.96960	51.22		62.85	2.95506		
Apr. 13				77.34		92.22			
18				74.38		88.62			
May 2				77.30		92.40			
4				67.50		80.26			
6				47.40		55.94			
7				70.18		83.20			
8				71.86	1.14569	83.28			
				67.15	1.82705	79.85	1.90227	8.92953	4 51 30 412 0
May 4	B Leonis	15 15	9.98442	65.20		80.57	2.97274		
7				73.80		90.84			
8				71.16	1.16051	87.37			
				70.05	1.84541	86.26	1.93581	8.92989	4 51 50 155 30
May 1	E Virginis	11 37	9.99181	57.04		70.95	3.00592		
2				71.72		89.90			
6				96.98		85.50			
7				49.80	1.16710	62.76			
				61.38	1.78503	77.28	1.88807	8.93294	4 53 50 215 20
1	γ Bootis	19 1	9.97565	65.35		78.03	2.95513		
2				68.20		82.40			
5				69.94		83.54			
7				68.88	1.15174	83.03			
				68.05	1.83283	81.75	1.91249	8.92792	4 50 30 202 0
							2.98457		

50) 2597 40
- 4 51 57

1878.

Inclination of Declination Wires. June 3-6.

Date	*	δ	$\log \cos \delta$	x	$\log 15 \cos x$	y	$\log y$	$15 x \cos y$	$\log \tan i$	i
June 3	K Drac.	70 28	9.52434	143.36		61.83				
5				154.90	0.70043	66.87				
				151.63	2.18079	64.25	1.80855	8.92733	4 50 10	100 20
					0.91658		2.88122			
5	2 Uro. Maj.	56 37	9.74049	112.14	2.04976	79.52	1.90048	8.93414	54 40	54 40
							2.96634			
5	E Virginis	11 37	9.99101	65.34	1.16710	81.37	1.91046	8.92818	50 40	50 40
					1.81518		2.98228			
3	γ Bootis	19 1	9.97565	68.38	1.15174	82.70	1.91751	8.93084	52 30	52 30
					1.83493		2.98667			
5	α Drac.	64 58	9.62661	92.16	0.80270	48.66	1.68717	8.91993	45 10	45 10
					1.96454		2.76724			
3	θ Bootis	52 25	9.78529	108.10		84.80				
5				108.56	0.96138	86.02				
				108.33	2.03475	85.41	1.93151	8.93538	55 30	111 0
					1.09583		2.99613			
5	δ Bootis	33 46	9.91974	77.35	1.88846	81.73	1.91238	8.92809	50 40	50 40
							2.98429			
6	α Comae	27 8	9.94939	77.46	1.12548	88.27	1.94581	8.93125	52 40	52 40
					1.88908		3.01456			

$$i = \frac{10 \times 517 \times 40 \times 9 \times 465}{-4 \times 51 \times 46 \times 4 \times 51 \times 40} = 0$$

Adopted value of i Feb. 7 - June 5

$$-4^{\circ} 51' 30''$$

$$\log \tan i = 8.92941n$$

$$15 \tan i = 0.10550n$$

$$\begin{array}{r} 42 \quad 2136 \quad 35 \\ 50 \quad 2597 \quad 40 \\ 9 \quad 465 \quad 0 \end{array}$$

$$101 \quad 5199 \quad 15 \\ \hline 51 \quad 28.5$$

Inclination of Declination Wires - June 6 - July 28

1878.

Date	*	δ	$\log \cos \delta$	χ	$\log 15 \cos \delta$	χ	y	$\log y$	$\log \tan i$	i
June 6	γ Bootis	19	1	9.97565	60.92	1.15174	72.62			
9				66.23	71.54	1.82105	79.84	1.90222	8.92943	4 51 30 103 0
20				75.50			90.98	2.97279		
24				83.86			76.73			
25				69.18			83.83			
26				61.76		1.15174	81.46	1.91094	8.92938	4 51 30 206 0
				67.58		1.82982	74.28	2.98156		
June 6	α Dra.	64	58	9.62661	124.32		67.37			
9					143.48	0.80270	77.30			
13				134.68	136.24	2.12931	72.96	1.86308	8.93107	4 52 40 158 0
19				152.88			82.58	2.93201		
20				136.46			74.10			
24				118.60			63.20			
26				130.90	115.66	0.80270	61.74			
						2.11694	70.40	1.84757	8.92893	4 50 30 202 0
								2.91964		
June 13	α Bootis	19	49	9.97348	67.18		80.40			
24					74.60		89.12			
25					69.30		82.53			
26					71.28	1.14957	85.10			
				70.59		1.84874	84.29	1.92578	8.92747	4 50 10 200 40
								2.99831		
June 6	δ Bootis	33	46	9.91974	79.32	1.09583	84.77			
9				77.89	76.46	1.89148	83.24	1.92033	8.93302	4 54 0 108 0
19				81.02			87.50	2.98731		
20				90.26			95.65			
24				79.14			84.73			
25				84.88		1.09583	90.15			
26				81.35	71.46	1.91036	86.99	1.93947	8.93326	4 54 10 270 50
July 1					70.62		75.35	3.00619		
3					83.96		88.88			
7					80.98		86.80			
10					81.76	1.09583	86.83			
				79.33		1.89944	84.44	1.92655	8.93128	4 54 50 211 20
								2.99527		
June 6	α Corvus	27	8	9.94939	77.46	1.88908	88.27			
19					82.22	1.12548	93.30	1.94581	8.93125	4 54 40 52 40
20				74.58	66.94	1.87262	84.72	3.01456		
July 7					71.52		80.26	1.92799	8.92989	4 51 50 103 40
8					74.14	1.12548	83.55	2.99810		
10				73.83	75.84	1.86823	83.66	1.92252	8.92881	4 51 10 153 30
13					97.88		77.00	2.99371		
15					66.84	1.12548	75.07			
23				69.92	75.04	1.84460	84.42			
							78.83	1.89669	8.92661	4 49 40 149 0
						1.17301		2.97008		
June 19	α Serpens	6	49	9.99692	69.82	1.84398	87.00	1.93952	8.92253	4 47 0 47 0
July 1					61.48		77.98	3.01699		
3					71.74		90.98			
8					70.56	1.17301	85.74			
10				68.02	68.28	1.83264	86.24	1.93571	8.93006	4 52 0 208 0
13					77		87.25	3.00565		
15					67.10		84.63			
16					68.24		86.30			
23					67.50	1.17301	85.00	1.93100	8.92798	4 50 30 151 30
				67.61		1.83001		3.00302		
June 19	ϵ Serpens	4	51	9.99844	64.86		83.18			
20					67.96		86.70			
24					68.02		86.86			
25					68.28	1.17453	88.34			
26				67.87	70.24	1.83168	86.92	1.93912	8.93291	4 53 50 269 10
July 1					69.10		87.70	3.00621		
3					72.46		92.35			
7					68.80		88.56			
8					70.92	1.17453	90.65			
10				70.24	69.92	1.84658	89.64	1.95250	8.93139	4 52 50 264 10
13					65.66		84.12	3.02111		
15					51.82		65.73			
22					60.02	1.17453	75.61	1.87868	8.93195	4 53 10 159 30
				59.17		1.77210		2.94663		
						1.01730				
July 28	α Hercules	46	4	9.84121	73.22	1.86463	65.14	1.81885	8.93192	4 53 10 53 10
						1.06860		2.88193		
July 28	α Lyra	38	40	9.89281	77.80	1.89098	77.87	1.89187	8.93179	4 53 10 53 10
								2.96958		

 $\log \tan i$ 8.93122 $\log \tan i$ 0.1073160/3124 20
-40 52 43

Note - Jan. 16, 1879.

The value of i given on the preceding page had been used for those dates before the values derived from the remaining observations of the year had been determined.

The value of i given on the following leaf for dates Sept. 2 - 17 have been used for those dates in the reduction of the observations of stars for Dr. Sumner.

For the final reductions the mean value for i from June 6 - Dec. 16 as given further on, viz. $-4^{\circ} 51' 53''$ has been used from June 6, 1878 - Jan. 5, 1879, and the data already computed with different values of it being recomputed.

[These two pages were left for the dates July 31 - Sept. 2. On account of the absence of J.F.M. only 18 was observed in this interval and hence no value of i could be obtained.]

1878.

Inclination of Declination Wires

Sept. 2, 9, 14-17.

Date	*	δ	$\log \cos \delta$	χ	$\log 15 \cos \delta$ χ	y	$\log \gamma$ $\log 15 \cos \delta$	$\log \tan i$	i
Sept. 15	γ Drae.	+51 30	9.79412	73.70	0.97021 1.86747	" 58.47	1.76693 2.83768	8.92925	4° 51' 20" 51' 20"
14	γ Serp.	-2 56	9.99943	69.38		58.66			
15				61.34		78.68			
16				48.90 59.87	1.17552 1.77721	62.92 76.75	1.88508 2.95273	8.93235	53 30 160 30
14	109 Hae.	+21 43	9.96803	70.80		83.02			
15				66.52		78.80			
16				76.16 71.16	1.14412 1.85224	90.17 84.00	1.92428 2.99636 1.84837	8.92792	50 30 151 30
17	α Lyrae	+38 40	9.89251	70.54	1.84844	70.53	2.91704	8.93131	52 45 52 45
16	β Lyrae	+33 13	9.92250	51.18		56.65			
17				55.66 53.42	1.09859 1.72770	57.63 58.14	1.76448 2.82629	8.93819	57 30 115 0
2	ν Lyrae	+35 56	9.90846	79.80		83.20			
9				75.62		77.63			
17				70.92 75.45	1.08485 1.87766	69.83 76.89	1.88587 2.96121	8.92466	48 20 145 0
2	κ Cygni	+53 9	9.77802	148.28	100.12	82.57	75.82		
9				91.96		69.07	2.95463		
15				93.78	2.00052	66.78	1.87978	8.92515	48 40 97 20
16				98.46 98.12	0.95411 [1.99176]	66.06 71.12	[1.85199] [2.94587]	[8.90612]	
9	β Cygni	+27 42	9.94712	74.46		83.83			
14				67.66		76.27			
15				77.50		87.02			
16				79.92 74.88	1.12321 1.87437	89.70 84.20	1.92531 2.99758	8.92773	50 20 201 20
15	γ Aquila	+10 19	9.99292	72.02		90.07			
16				67.46		84.98			
17				65.06 68.18	1.16901 1.83366	81.10 85.38	1.93136 3.00267	8.92869	51 0 153 0
14	α Aquila	+8 33	9.99515	63.48		79.37			
15				64.54		81.40			
16				72.42		90.04			
17				62.24 65.67	1.17124 1.81787	78.60 82.35	1.91566 2.98861 1.86499	8.92705	50 0 200 0
2	β Cygni	+46 22	9.83883	84.06	1.92459	73.28	2.93951	8.92548	48 50 48 50
2	α Cygni	+44 51	9.85066	78.52		71.48			
9				71.26 74.89	1.02675 1.87442	64.87 68.18	1.83366 2.90117	8.93249	53 30 107 0
2	ν Cygni	+40 42	9.87976	78.16		75.63			
9				78.62		75.10			
14				87.14		83.55			
15				84.02		81.77			
17				87.92 83.17	1.05585 1.91997	84.46 80.10	1.90363 2.97582	8.92781	50 30 252 30
9	ζ Cygni	+29 44	9.93871	71.00		79.16			
14				79.78 75.44 39	1.11480 1.87731	88.76 83.96	1.92407 2.99281	8.93196	53 10 106 20

36) 1842 25

 $i = -4^{\circ} 51' 11''$ $\log \tan i$ 8.92893m $\log 15 \tan i$ 0.10502m

Inclination of Inclination Wires Sept. 18 - Oct. 16 1878

Date	*	δ	$\log \cos \delta$	χ	$\log 15 \cos \delta$	χ	$\log 15 \sin \delta$	$\log \tan i$	i
Sept. 18	γ Lyrae		9.90846	60.36	1.08455	61.36			
19				66.18	1.87823	66.83			
22				84.24		86.55			
23				86.14		88.23			
28				80.84		82.48	1.88700		
			75.55		77.09		2.96278	8.92422	4 48 0 240 0
Sept. 18	γ Aquila		9.99292	76.46	1.16901	89.13			
19				62.50	1.83238	78.68			
22				69.38		87.97			
28				68.60		86.33	1.93212		
			67.98		85.53		3.00139	8.93073	52 20 209 20
Sept. 18	α Aquila		9.99515	70.40	1.17124	89.52			
19				63.52	1.82814	80.32			
22				65.46		83.83			
23				67.54		86.15			
25				69.66		86.05	1.92978		
			67.32		85.07		2.99938	8.93040	52 10 260 50
Sept. 23	β Cygni		9.83883	61.48	1.01492	53.60			
25				88.96	1.87726	71.58			
28				60.32		52.55	1.81823		
30			75.38	90.76		79.45	6.58028	2.18	8.92605 49 20 197 20
Oct. 1				76.64		65.90			
2				86.78		76.10	1.86964		
3			84.88	91.22	1.92881	80.22	7.40294	3.73	8.92591 49 10 147 30
8				63.80		56.17			
10				94.62		82.63			
14				95.26		83.77			
16				67.50		59.20	1.84782		
			80.30		1.90472	70.44	2.91964	8.92818	50 40 202 40
Sept. 18	β Delphinii		9.98658	73.74	1.16267	90.90			
19				53.10	1.82099	65.08			
23				68.56		84.18			
25				68.82		86.20			
28				68.82		85.35	1.91392		
30			66.22	65.26		80.44	2.22983	3.66	8.93026 52 0 312 0
Oct. 1				63.26		77.82			
2				50.48		63.83	1.89741		
3			63.76	78.54	1.80455	95.72	7.89629	6.72	8.93019 52 0 156 0
8				70.32		86.40			
16				69.72	1.84522	86.75	1.93742		
			70.02			86.58	3.00789	8.92953	51 30 103 0
Sept. 23	α Cygni		9.85066	76.42	1.02675	69.37			
Oct. 1				87.28	1.91845	79.60			
2				77.12		67.84	1.87645		
3			82.88	90.70		82.13	7.52429	4.520	8.93125 52 40 210 40
8				73.64		66.77			
10				90.70		64.03			
14				87.48		79.52			
16				93.28		85.97	1.86964		
			81.28		1.90998	74.07	2.93673	8.93291	53 50 215 20
Sept. 18	ν Cygni		9.87976	54.06	1.05585	52.87			
19				84.84	1.87512	82.17			
23				67.44		64.38	1.86034		
25			75.01	93.70		90.60	7.50293	0.97	8.92937 51 30 206 0
Oct. 1				90.08		87.38			
2				79.06		76.44	1.91121		
3			84.45	84.20	1.92660	80.72	8.15129	8.245	8.92876 51 0 153 0
10				85.30		82.82			
14				90.90		87.90	1.93125		
			88.10		1.94498	85.36	3.00083	8.93042	52 0 104 0

$$53 \overline{) 2717} \begin{array}{r} 51 \\ 40 \end{array}$$

$$i = -4^{\circ} 51' 17''$$

Inclination of Declination Wires. Oct. 29 - Nov. 30									
Date	*	δ	$\log \cos$	x	$\log 15 \cos$	y	$\log 15 \cos$	$\log \tan$	i
Nov. 2	β Aquila		9.99753	56.78	1.17362	72.42			
3				60.80	1.50726	77.87			
5				75.88		98.60			
6				63.20		79.90	1.91487		
				64.16		82.20	2.98088	8.93399	4 54 30 218 0
Nov. 2	α Aquila		9.99515	65.34	1.17124	82.40			
3				65.28	1.79106	81.85			
4				45.70		58.13			
5				70.92		90.23	1.89310		
				61.81		78.18	2.96230	8.93080	52 30 210 0
Oct. 29	τ Cygni		9.89932	84.98	1.07541	85.28			
Nov. 5				60.76	1.87754	63.47			
6				87.54		82.36	1.88672		
				75.43		77.04	2.95295	8.93377	54 30 163 30
Nov. 2	β Cephei	70 1	9.82353	67.46	1.70962	28.50			
3				99.90	2.05534	44.20			
5				183.66		63.17			
6				143.34		61.86	1.69399		
				113.59		49.43	2.76496	8.92903	51 10 204 40
Nov. 2	α Aquarii		9.99994	51.56	1.17603	65.97			
3				65.30	1.80862	85.88			
4				60.98		78.20			
5				70.90		91.70			
6				69.00		89.03			
10				66.42		85.90	1.91793		
				64.36		82.78	2.98465	8.93328	54 10 325 0
Oct. 29	γ Aquarii		9.99974	73.06	1.17583	93.42			
Nov. 2				62.78	1.83347	81.45			
3				65.88		84.65			
4				68.18		88.87			
10				71.34		91.10	1.94399		
				68.15		87.90	3.00930	8.93469	55 0 275 0
Nov. 2	γ Pegasi		9.93934	76.44	1.11543	83.93			
Oct. 29				83.14	1.86421	90.97			
5				54.58		62.27			
6				80.82		88.30			
10				98.94		64.83			
12				78.52		87.22			
13				79.60		86.93	1.90628		
26				73.15		80.59	2.97964	8.92664	49 40 347 40
Nov. 3	λ Pegasi		9.96427	71.98	1.14036	85.16			
10				55.70	1.82995	65.24			
12				77.62		92.17			
13				70.20		82.50			
24				62.50		74.03	1.90211		
				67.60		79.82	2.97031	8.93180	53 10 265 50
Oct. 29	ν Cephei	65 34	9.61675	96.24	0.79284	52.73			
Nov. 5				118.08	2.03671	62.82			
24				114.24	2.05312	60.83	7.916		
26				106.70		56.78	1.76559	3.20	54 162
				108.82		58.29	2.82955	8.93004	56 0 224 0
				113.01		60.14	4.596		
Nov. 3	α Pegasi		9.98584	71.92	1.16193	87.65			
24				68.92	1.85175	86.07			
26				72.40		90.23	1.94438		
				71.08		87.98	3.01368	8.93070	52 0 156 0
Oct. 29	γ Pleiades		9.99955	68.58	1.17564	87.40			
Nov. 30				72.48	1.84837	92.80	1.95472		
				70.53		90.10	3.02401	8.93071	52 20 104 40

$\frac{46}{2} \overline{) 2494} \quad 20$
 $\frac{46}{2} \overline{) 453} \quad 4$
 $\frac{46}{2} \overline{) 452} \quad 53$

Inclination of Declination Wires

Dec. 1878.

Date	*	δ	$\log \cos \delta$	χ	$\log 15 \cos \delta$	χ	$\log 15 \cos \delta$	$\log \tan i$	i
Dec. 1	γ Pegasi		9.93934	72.90	1.11543	79.44			
7				76.48	1.86923	84.36			
12				72.62		80.16	1.91020		
				78.00		81.32	2.98466	8.92554	4 49 0 147 0
Dec. 1	α Pegasi		9.98584	73.32	1.16193	91.33	1.96061		
					1.86522		3.02715	8.93346	54 10 54 10
Dec. 1	γ Piscium		9.99955	74.90	1.17564	99.20	1.99651		
					1.87448		3.05012	8.94639	5 3 0 $\checkmark$ ref.]
Dec. 12	γ Pegasi		9.98593	68.76	1.16202	86.37	1.93636		
					1.83734		2.99936	8.93700	4 56 40 56 40
Dec. 1	α Cass.		9.74905	72.42	0.92514	50.17			
7				57.12	1.93148	40.80			
12				54.46		41.70			
14				91.76		66.65			
16				91.22		65.12	1.78455	8.92795	50 30 252 30
				85.40		60.89	2.85660		
Dec. 1	γ Cass.		9.73414	105.28	0.91023	73.40			
7				106.84	2.03362	74.15			
14				93.78		64.56			
16				126.30		87.52	1.87454	8.93069	52 20 209 20
				108.05		74.91	2.94385		
Dec. 1	δ Cass.		9.70417	71.30	0.88026	47.74			
14				121.42	1.95119	79.53			
16				75.38		48.35	1.76745		
				89.37		58.54	2.83145	8.93600	56 0 168 0
Dec. 14	γ Piscium		9.98581	62.64	1.16160	77.96	1.89187		
					1.79685		2.95845	8.93342	54 10 54 10
Dec. 1	α Persei		9.82543	74.38	1.00152	63.36	1.80182		
					1.87146		2.87298	8.92884	51 10 51 10
Dec. 14	α Piscium		9.99516	73.52	1.17125	92.95			
16				56.64	1.81345	71.43	1.91482	8.93012	52 0 104 0
				65.08		82.19	2.98470		
Dec. 7	β Arietis		9.97240	75.94	1.14849	90.78			
16				77.22	1.85479	80.60	1.93293		
				71.58		85.69	3.00328	8.92965	51 40 103 20
Dec. 7	α Cass.		9.49393	125.06	0.67002	48.78			
16				130.32	2.11541	52.25	1.70346		
				127.69	1.0615	57.52	2.78578	8.94843	50 10 100 20
							1.95400		
Dec. 16	β Triang.		9.91647	84.88	1.09256	89.95	3.02137	8.93263	53 40 53 40
Dec. 7	α Persei		9.81945	99.70	1.92881	82.90			
16				103.06	0.99554	86.93	1.92901		
				101.38	2.00595	84.92	3.00149	8.92752	50 10 100 20

Final Results.

63 3124 20
36 1842 25
53 2717 40
46 2432 20
28 1454 40

223/11571 25

 $i = -4^{\circ} 51' 53''$ $\log \tan i 8.92998 m$ $\log \tan i 0.10607 m$

Adopted value June 6, 1878 - Jan. 5, 1879.

28/1454 40
6 = -4 51 51

1879

Inclination of Declination Wires.

Feb. 15 — Mar. 8.

Date	*	δ	$\log \cos \delta$	$\times$	$\log 15 \cos \delta$ " $\times$	z	$\log y$ " $15 \cos \delta$	$\log \tan i$	i
Feb. 15	γ Orionis	6. 14	9.99742	61.48	1.17351	78.53			
" 16				48.06	1.72403	62.32			
" 24				50.40		64.71			
" 27				60.22		79.29			
Mar. 2				47.74		63.10			
" 3				49.90		66.07	1.83885	8.94131	4 59 30
				52.99		69.00	2.89754		357 0
Feb. 15	δ Orionis - 0	24	9.99999	52.18	1.17608	67.43			
" 16				54.24	1.73520	70.46			
" 24				57.02		73.37			
" 26				48.36		65.79			
" 27				57.10		74.54			
Mar. 2				53.88		71.94			
" 3				57.64		75.35			
				54.35		71.27	1.85291	8.94163	4 59 50
							2.91128		418 50
Feb. 16	β Orionis - 8	20	9.99539	58.98	1.17148	76.22			
" 24				45.26	1.71332	58.14			
" 26				56.52		70.90			
Mar. 2				43.72		54.81			
" 3				53.94		68.82	1.83110	8.94630	5 3 0
				51.68		67.78	2.88480	3.329	4 54 10
									270 50
Feb. 15	κ Orionis - 9	43	9.99372	53.32	1.16981	70.00			
" 24				50.22	1.71189	65.20			
" 26				46.28		60.10			
Mar. 3				46.32		60.06			
" 5				61.94		80.03			
" 8				50.96		66.03	1.82549	8.94379	5 1 20
				51.51		66.91	2.88170		368 0
Feb. 15	λ Orionis	7 23	9.99638	52.48	1.17247	67.13			
" 24				55.64	1.76462	74.50			
" 26				58.68		78.23			
" 27				59.00		78.58			
Mar. 3				58.48		77.01			
" 5				65.58		79.05			
" 8				57.26		75.45	1.87915	8.94206	5 0 10
				58.16		75.71	2.93709		421 10
Feb. 24	ϵ Orionis - 1	17	9.99989	53.68	1.17598	71.08			
" 26				53.66	1.73965	69.58			
" 27				57.40		74.61	1.85588	8.94025	4 59 20
Mar. 8				47.00		71.76	2.91563		178 0
				54.91					
Feb. 15	ζ Columbae - 34	8	9.91789	48.38	1.09398	52.73			
" 24				49.72	1.69443	51.83			
" 27				41.08	67191	43.48			
Mar. 3				48.72		53.42	1.70217	8.91376	4 44 10
				44.48		50.37	2.78844	3.628	4 56
				46.98			6.589		224 40
Feb. 15	τ Virginis	2 8	9.99970	47.22	1.17579	63.68	1.80400		
" 22				48.21	1.67413	—	2.84992	8.95408	[5 8 30]
Mar. 8				24.72		—			
Feb. 15	ζ Ophiuchi - 10	19	9.99292	47.44	1.16901	60.77			
" 18				47.80	1.68601	60.76			
" 22				49.74		63.21			
" 23				53.74		69.93			
Mar. 1				43.94		56.01	1.79337	8.93835	4 57 30
" 2				48.53		62.14	2.85502		287 30
Feb. 15	β Librae - 8	56	9.99470	43.34	1.17079	55.48			
" 22				45.70	1.64856	57.60	1.75236	8.93301	4 54 10
				44.52		56.54	2.81935		108 0

$$i = \frac{45}{4} 26 34 0$$

$$i = 4^{\circ} 58' 32''$$

1877

Inclination of Declination Wires

Jan 20 - Jan 26

Date	*	S	log cos S	x	log 15 cos	y	log 15 x cos	log tan i	i
Jan 20	d Ceti	+3 37	9.99913	69.06	1.17522	87.07			
25				71.24	1.53721	92.13			
26				65.92		84.60	1.94414	8.93171	4 53 00 159 0
				68.74		87.93	3.01243		
Jan 20	B. Persei	+40 29	9.88115	89.94	1.05724	87.23			
23				68.78	1.88298	62.64			
25				80.86		78.86			
26				65.92		84.60	1.89393	8.95371	[5 8 10]
				76.38		78.33	2.94022		
Jan 20	48° 6' 16" Cap	+77 17	9.34268	158.58	0.51877	44.25			
23				161.04	2.23292	45.43			
25				196.58		51.83			
26				167.68		48.30	1.67624	8.92455	4 48 20 193 20
				170.97		47.45	2.75169		
Jan 25	d Persei	+49 25	9.81328	78.22	0.98937	65.40			
26				90.28	1.72557	75.00	1.84634	8.93140	4 52.50 105 40
				84.25		70.20	2.91494		
Jan 20	S Persei	+47 24	9.83051	95.88	1.00668	83.44			
23				85.96	1.74062	75.05			
25				65.14		57.40			
26				101.92		88.83	1.88184	8.93462	4 55 0 220 0
				87.22		76.18	2.94722		
Jan 20	E Persei	+39 39	9.88647	76.94	1.06256	74.13			
23				92.28	1.72241	91.46			
25				87.88		85.62			
26				77.48		77.04	1.91413	8.92916	4 51 20 205 20
				83.64		82.06	2.98497		

171 883 40

L = 4° 51' 58"

log tan i 8.93010

" 15 tan i 0.10619

Inclination wires from Nov. 10 1870 to Dec 31 1879

Resume

Note. i is positive when $T_m - T_j$ is positive for a transit preceding the middle wire.

Spider Lines.

Date	i	by $15 \tan i$
Nov 10 1870 to May 18 1871 - 4° 40' 28"		0.08794 _m
May 18 1871 to May 29 1871 + 5 8		0.12953
June 1 1871 to June 6 1871 + 5 1		0.11949
June 7 1871 to June 19 1871 + 4 52		0.10625
June 20 1871 to July 17 1871 + 5 16		0.14073
July 23 1871 to Jan 24 1872 + 5 6		0.12669
Jan 25 1872 to May 29 1872 - 5 0		0.11804 _m
May 30 1872 to Sept 24 1872 - 4 58 24		0.11571 _m
Sept 25 1872 to Oct 29 1872 + 4 43 19		0.09302
Oct 30 1872 to Dec 31 1873 - 4 58 24		0.11571 _m
Jan 15 1874 to Apr 12 1874 + 4 59 8		0.11767
Apr 13 1874 to May 28 1874 + 4 54 28		0.10992
May 29 1874 to Sept 10 1874 + 4 51 50		0.10600
Sept 11 1874 to Oct 28 1874 + 4 50 54		0.10460
Oct 29 1874 to Dec 10 1874 + 4 48 44		0.10134
Dec 11 1874 to Dec 31 1874 + 4 43 22		0.09315

Date	ϵ	$\log \tan i$
Jan 1 1875 to Aug 4 1875	$+5^{\circ} 5' 11''$	.12552
Aug 5 to Aug 11	$+5^{\circ} 9' 22''$	.13146
Aug 12 1875 to Dec 31 1875	$+5^{\circ} 5' 11''$	~~.12146~~ .12552
Jan 10 1876 to May 1 1876	$+5^{\circ} 4' 47''$	.12495
May 3 1876 to Aug 23 1876	$+5^{\circ} 2' 41''$	.12193
Aug 24 1876 to Aug 5 1876	$+5^{\circ} 4' 56''$	.12516
Aug 6 1876 to Jan 4 1877	$+5^{\circ} 2' 59''$	.12236
Jan 13 1877 to Mar 1 1877	$+5^{\circ} 4' 14''$	.12416
Mar 2 1877 to May ¹⁴ 1877	$+5^{\circ} 1' 41''$	.12048
May 15 1877 to Aug 4 1877	$+4^{\circ} 59' 45''$	.11768
Aug 5 1877 to Dec 31 1877	$+5^{\circ} 3' 9''$	.12260
Jan 1 1878 to Feb. 6 1878	$+5^{\circ} 4' 40''$	.12478
Feb. 7 1878 to ~~Mar 4~~ ^{June 5} 1878	$+4^{\circ} 51' 30''$	.10550 _m
June 6 1878 to Jan 6 1879	$-4^{\circ} 51' 53''$	.10607 _m
Jan 20 1879 to Jan 26 1879	$-4^{\circ} 51' 58''$	.10619 _m

The above are for zenith distances

