1867hhae.proj : 336A

KG
11365
335

04

H. C. O.

East Transit

1867 Nov. 9

to

1868 July 10

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data System

KG 11365.335

1867phae.proj..336A

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Harvard College Observatory.

Time Stars.

November 9, 1867 to
July 10, 1868, inclusive.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

$$\alpha = \tau + \Delta\tau + m + n\,\mathrm{tg}\,\delta + c\,\sec\delta$$

$$m = b\,\sec\varphi - n\,\mathrm{tg}\,\varphi$$

$$n' = c + n$$

$$m + c = m' = b\,\sec\varphi + c(1 + \mathrm{tg}\,\varphi) - n'\,\mathrm{tg}\,\varphi$$

$$1.354\,b + 1.912\,c - 912\,n'$$

Harvard College Observatory

Long. W $4^h\,44^m\,29^s.7$
Σ 0 23 41 5

Geonwich
Washington

Lat 42 22 48.6 nat tan 0.9125 sec 1.353
log. tan 9.9602 0.1315

From obs of Polaris from Oct 27 1867 to March 5th 1868 wire interval to reduce to mean of 5 wire

Wire	Diff'n	Scale		logs	log sin
1	$+7^s.21$	$7^s.22$	+1	0.8579	6.7195-3
2	+ 8.59	+ 3.63	+4	0.5547	6.41641
3	+ 0.08	- 0.01	-1	8.913	4.775
4	- 3.60	- 3.60	0	0.5561	6.41774
5	- 7.28	- 7.25	+3	0.8621	6.72378

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

KG 11365. 336

Fr. 8421.

		slow	daily rate losing	
Nov 9.91		23.16	1.75	
11.34		25.66	3.40	
12.16		28.45	3.34	
13.41		32.62	4.65	nearly ran down
17.42		51.22	3.78	
18.09		53.75	5.22	
Dec 2.13	2	7.11	4.79	
9.12		40.62	5.60	
17.14	3	25.52	4.45	
27.16	4	9.99 fast	46.05 gaining	regulator adjusted Dec 27 at 8 PM.
Jan 7.15	4	16.57	44.00	
10.05	6	24.19	"	" Jan 10 at $2\frac{3}{4}$ PM

HARVARD UNIVERSITY LIBRARY MAY 3 1956

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Nov 9		
Observer				
Illumin'n				
Star		Fr. 8421		
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	13 9	14.4	
"	2		19.6	
"	3		24.5	
"	4		29.5	
"	5		34.5	
"	d			
"	e			
"	f			
Sum				
Mean			24.50	
Red'n to m		13 9	20.91	
n. tan. δ		8 41	1.56	
c. sec. δ		1	50.69	
τ		8 42	52.25	
T		21 52	13.16	
a		21 51	50	
Δ T			+ 23.16	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		1867 Nov 11		
Observer		G M S		
Illumin'n		W		
Star		ι Piscium	2 Draconis LC	γ Cephei
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	23 21 10·5	23 23 12·7	23 33 28·1
"	2	14·3	22·2	43·8
"	3	18·0	33·1	59·4
"	4	21·7	43·6	34 15·4
"	5	25·2	54·5	31·1
"	d			
"	e			
"	f			
Sum		89·7	166·1	207·8
Mean		23 21 17·94	23 23 33·22	23 33 59·56
Red'n to				
$\overline{m}$		+ 73	+ 73	+ 73
n . tan. δ		− 33	− 1·50	+ 1·38
c . sec. δ		+ 70	− 2·05	+ 3·09
r		+1·10	−2·82	+ 5·20
T		23 21 19·04	23 23 30·40	23 34 4·76
a		23 21 16·18	11 23 27·56	23 34 1·91
Δ T		− 2·86	− 2·84	− 2·85

$n = +\cdot 40$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date								Nov 12.			
Observer											
Illumin'n											
Star		Fr. 8421			Fr. 3242			Fr. 8421			
Mag.											
δ											
Wire	a										
"	b										
"	c										
"	1	23	26	13·3	23	27	22·1	19	20	1·1	
"	2			18·3			27·0			6·3	
"	3			23·3			32·0			11·2	
"	4			28·3			37·1			16·2	
"	5			33·1			42·0			21·2	
"	d										
"	e										
"	f										
Sum											
Mean		23	26	23·26			32·04	19	20	11·20	
Red'n to m		23	26	20·41	23	27	29·19	19	20	8·78	
n. tan. δ		8	37	5·65	8	37	5·65	8	33	9·74	
c. sec. δ				9·60			9·42			49·93	
r		8	37	15·25	8	37	15·07	8	33	59·67	
T		8	3	35·66	8	4	44·26	3	54	8·45	
a		8	3	10	8	7	10	3	53	40·	
Δ T				+ 25·66		— 2	25·74			+ 28·45	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		1867 Nov 13		
Observer		G M S		
Illumin'n		W		
Star		δ Ceti	α Cassiop	η Piscium
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	1 17 19.5	1 21 8.1	1 24 19.1
"	2	23.1	18.6	22.8
"	3	26.9	29.1	26.7
"	4	30.4	39.1	30.4
"	5	34.3	49.9	34.2
"	d			
"	e			
"	f			
Sum		134.2	144.8	133.2
Mean		1 17 26.84	1 21 28.96	1 24 26.64
Red'n to m		+49	+49	+49
n . tan. δ		−47 ~~+84~~	+78 ~~+138~~	−29 ~~+50~~
c . sec. δ		+70	+2.01	+72
r		+72 ~~+87~~	+3.28 ~~+3.03~~	+92 ~~+1.01~~
		27.56	32.24	27.56
T		1 17 ~~27.71~~	1 21 ~~31.99~~	1 24 ~~27.65~~
a		1 17 25.73	1 21 30.42	1 24 25.74
Δ T		−1.83	−1.82	−1.82

n = + 3m 44

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date				
Observer				
Illumin'n				
Star		Fr. 8421	Fr. 3242	236
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	1 26 55·6	1 28 12·6	1 29 8·1
"	2	27 0·6	17·8	13·0
"	3	5·8	22·6	18·1
"	4	11·0	27·7	23·2
"	5	15·9	32·8	28·0
"	d			
"	e			
"	f			
Sum				
Mean		1 27 5·78	1 28 22·70	1 29 18·08
Red'n to m		1 27 3·96	1 28 20·88	1 29 16·26
n. tan. δ		8 25 17·92	8 25 17·92	
c. sec. δ		+ 3 45·74	3 45·52	
r		8 29 3·66	8 29 3·44	
T		9 57 7·62	9 57 24·32	
a		9 55 35	9 59 55 30·68	1 31 15
Δ T		+ 32·62	— 2 [illegible]	— 1 58 74

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Nov 17		
Observer		S		
Illumin'n		W		
Star		φ Arietis	50 Cassiop	α Arietis
Mag.				
δ				
Wire	a			
"	b			
"	c			
			51 49.3	
"	1	1 47 13.0	1 52 1.7	1 59 35.9
"	2	16.9	13.6	39.6
"	3	21.0	24.4	43.6
"	4	24.6	36.6	47.1
"	5	28.3		51.2
"	d			
"	e			
"	f			
Sum		103.8	65.7	217.6
Mean		1 47 20.76	1 52 13.14	1 59 43.52
Red'n to				
m		+ 46	+ 46	+ 46
n . tan. δ		− 27	+ 1.02	− 24
c . sec. δ		+ 75	+ 2.24	+ 76
r		+ .94	+ 3.72	+ .94
T		1 47 21.70	1 52 16.86	1 59 44.46
a		1 47 21.68	1 52 17.00	1 59 44.83
Δ T		∓ 02	+ 14	+ 37

n = + 48
ΔT = + 0.16

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date								Nov 18		
Observer											
Illumin'n											
Star		Fr. 8421			3242			8421		
Mag.											
δ											
Wire	a										
"	b										
"	c										
"	1	1	53	40·6	1	54	52·7	17	57	0·6
"	2			45·3			57·5			5·4
"	3			50·5		55	2·7			10·4
"	4			55·3			7·6			15·4
"	5		54	0·4			12·7			20·4
"	d									
"	e									
"	f									
Sum											
Mean		1	53	50·42	1	55	2·64	17	57	10·44
Red'n to m		1	53	50·58	1	55	2·80	17	57	10·93
n. tan. δ		8	9	34·29	8	9	34·29	8	9	34·29
c. sec. δ			3	41·35		3	41·15		1	3·53
τ		8	13	15 64	8	13	15 44	8	10	37·82
T		10	7	6·22	10	8	18·24	2	7	48·75
a		10	6	15	10	10	55	2	6	55
Δ T			+	51·22		− 2	26·76		+	53·75

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Nov 27		
Observer		E P A		
Illumin'n		W		
Star		δ Piscium	λ Draconis	γ Cephei
Mag.			& C	
δ				
Wire	a			
"	b			
"	c			
"	1	23 21 1·2	23 23 5·0	23 33 16·6
"	2	4·9	15·7	32·0
"	3	8·7	25·3	49·0
"	4	12·0	36·5	34 4·2
"	5	15·9	47·1	20·8
"	d			
"	e			
"	f			
Sum		42·8	129·6	242·6
Mean		23 21 8·56	23 23 25·92	23 33 48·52
Red'n to				
m		+45	+45	+45
n . tan. δ		−49	−2·24	+2·06
c . sec. δ		+71	−2·05	+3·09
r		+67	−3·84	+5·60
T		23 21 9·23	23 23 22·08	23 33 54·12
a		23 21 15·99	11 23 28·63	23 34 0·69
Δ T		+6·76	+6·55	+6·57

$n = +.61$

$\Delta T = +6.62$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date								Dec 2.			
Observer											
Illumin'n											
Star		Gr. 4163			ω Piscium			Gr. 8421			
Mag.											
δ											
Wire	a										
"	b										
"	c										
"	1	23	47	52·7	23	52	17·1	19	57	42·0	
"	2		48	5·5			20·8			47·0	
"	3			18·5			24·3			51·9	
"	4			30·3			28·0			57·1	
"	5			44·8			31·8		58	1·9	
"	d										
"	e										
"	f										
Sum				91·8			122·0				
Mean		23	48	18·36	23	52	24·40	19	57	51·98	
Red'n to								19	58	1·82	
m				+45			+45	7	14	31·55	
n. tan. δ				+1·35			−43			43·74	
c. sec. δ				+2·50			+·71				
r				+4·30			+73	7	15	15·29	
T		23	48	22·66	23	52	25·13	3	13	17·11	
a		23	48	29·42	23	52	31·88	3	11	10	
Δ T				+6·76			+6·75		+2	7·11	

$n = +\cdot 54$

$\Delta T = +6\cdot 75$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Dec 8		
Observer		G M S		
Illumin'n		W		
Star		ψ¹ Drac. fr	α Orionis	Fr. 3242
Mag.		2 C.		
δ				
Wire	a			
"	b			
"	c			
"	1	5 43 37.9	5 47 39.3	5 49 5.5
"	2	50.2	43.1	10.4
"	3	44 1.2	47.0	15.5
"	4	13.5	50.3	20.5
"	5	25.8	53.7	25.6
"	d			
"	e			
"	f			
Sum		8.6	233.4	
Mean		5 44 1.72	5 47 46.68	5 49 15.50
Red'n to				5 49 30.14
m		+ 53	+ 53	
n . tan. δ		− 1.45	− 28	
c . sec. δ		− 2.29	+ 71	
r		− 3.21	+ 96	−17 9 57.10
T		5 43 58.51	5 47 47.64	12 39 33.04
a		17 44 13.15	5 48 2.29	12 39 40
Δ T		+ 14.64	+ 14.65	− 6.96

n = + 36

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Dec 9		
Observer				
Illumin'n				
Star		Fr. 8421		
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	20 0	11·4	
"	2		16·6	
"	3		21·4	
"	4		26·8	
"	5		31·7	
"	d			
"	e			
"	f			
Sum				
Mean		20 0	21·58	
Red'n to		20 0	36·68	
m				
n . tan. δ				
c . sec. δ				
r		−17 12	16·06	
T		2 48	20·62	
a		2 45	40	
Δ T		+ 2	40·62	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Dec 16		
Observer		E P A		
Illumin'n				
Star		ε Piscium	ν' Ceti	η Piscium
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	0 55 34·8	1 16 53·6	1 23 54·5
"	2	38·5	57·3	58·1
"	3	42·3	0·9	2·1
"	4	45·9	4·6	5·7
"	5	49·6	8·1	9·6
"	d			
"	e			
"	f			
Sum		211·1	4·5	10·0
Mean		0 55 42·22	1 17 0·90	1 24 2·00
Red'n to				
$\overline{m}$		+ 50	+ 50	+ 50
n . tan. δ		− 39	− 53	− 32
c . sec. δ		+ 70	+ 70	+ 72
r		+0·81	+ 67	+ 90
T		0 55 43·03	1 17 1·57	1 24 2·90
a		0 56 5·70	1 17 25·57	1 24 25·54
Δ T		+ 22·67	+ [23·94]	+ 22·64

m assumed = + 50

ΔT = + 22·69

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date				Dec 17
Observer				
Illumin'n				
		o Piscium		
Star		~~β Arietis~~	β Arietis	Fr. 8421
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	1 37 54·9	1 46 50·1	21 11 47·6
"	2	58·5	53·9	52·6
"	3	2·2	58·0	57·7
"	4	5·8	47 1·7	12 2·3
"	5	9·6	5·6	7·4
"	d			
"	e			
"	f			
Sum		11·0	289·3	
Mean		1 38 2·20	1 46 57·86	21 11 57·52
Red'n to				21 12 21·04
m		+ 50	+ 50	
n . tan. δ		− 38	− 27	
c . sec. δ		+ 71	+ 75	
r		+ 83	+ 98	−17 43 55·52
T		1 38 3·03	1 46 58·84	3 28 25·52
a		1 38 25·80	1 47 21·53	3 25 0
Δ T		+ 22·77	+ 22·69	+ 3 25·52

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Dec 18		
Observer		E P A		
Illumin'n		w		
Star		α Ceti	48 Cephei	ζ Arietis
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	2 54 50·2	3 2 42·8	3 6 46·1
"	2	54·0	59·5	50·0
"	3	57·7	3 15·9	53·9
"	4	55 1·2	32·0	57·7
"	5	5·0	49·1	7 1·5
"	d			
"	e			
"	f			
Sum		288·1	79·3	269·2
Mean		2 54 57·62	3 3 15·86	3 6 53·84
Red'n to				
m		+ 36	+ 36	+ 36
n . tan. δ		−35	+ 1·44	−22
c . sec. δ		+ 70	+ 3·17	+ 75
r		+ 71	+ 4·97	+ 89
T		2 54 58·33	3 3 20·83	3 6 54·73
a		2 55 23·38	3 3 45·88	3 7 19·79
Δ T		+ 25·05	+ 25·05	+ 25·06

$n = +41$
$\Delta T = +25{\cdot}05$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Dec 26		
Observer		C P A		
Illumin'n		w		
Star		α Tauri	α Camelop	ι Aurigae
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	4 27 37·2	4 40 2·6	4 47 39·2
"	2	40·9	11·7	43·3
"	3	44·6	20·9	47·9
"	4	48·5	29·7	52·0
"	5	52·2	38·1	56·3
"	d			
"	e			
"	f			
Sum		223·7	103·0	238·7
Mean		4 27 44·74	4 40 20·60	4 47 47·74
Red'n to		A		
m		+ 49	+ 49	+ 49
n. tan. δ		−21	+51	−10
c. sec. δ		+ 74	+ 1·73	+ 83
r		+1·02	+2·73	+1·22
T		4 27 45·76	4 40 23·33	4 47 48·96
a		4 28 21·77	4 40 59·34	4 48 25·11
Δ T		+ 36·01	+ 36·01	+ 36·15

$n = + \cdot 38$

$\Delta T = + 36 \cdot 06$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Dec 27				
Observer						
Illumin'n						
Star		Fr. 8421			Fr. 3242	
Mag.						
δ						
Wire	a					
"	b					
"	c					
"	1	22 9	12·0	22 2	25·1	
"	2		16·8		30·1	
"	3		22·0		35·0	
"	4		26·9		40·1	
"	5		32·0		45·1	
"	d					
"	e					
"	f					
Sum						
Mean		22 9	21·94	22 2	35·08	
Red'n to m		22 9	59·10	22 3	12·24	
n. tan. δ		5 36	13·76	5 36	13·76	
c. sec. δ			22·12		23 22	
r		5 36	35·89	5 36	36·98	
T		3 46	35 99	3 39	49·22	
a		3 42	25	3 40	10	
Δ T			+4 9·99		— 20 78	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Jan 6				Jan 6				Jan 6					
Observer															
Illumin'n															
Star		β Arietis				50 Cassiop.				~~Arietis~~ 39 Piscium					
Mag.															
δ															
Wire	a														
"	b														
"	c														
										1 37 38					
"	1	1	46	21·9		1	50	58·0		1 ~~54~~		~~14·2~~		26·4	
"	2			25·6			51	8·6				~~17·9~~		30·1	
"	3			29·3				20·8				~~21·5~~		34·0	
"	4			33·2				32·2				~~25·0~~		37·4	
"	5			37·2				43·8				~~28·7~~		41·3	
"	d														
"	e														
"	f														
										37					
Sum				147·2				103·4		1 ~~38~~		~~167·3~~		169·2	
Mean		1	46	29·44		1	51	20·68		1 ~~54~~		~~21·46~~		33·84	
Red'n to															
m				+26				+26				+26			
n. tan. δ				−23				+89				−32			
c. sec. δ				+75				+224				+71			
								+3·39							
r				+78				~~+1·61~~				+65			
								24 07							
T		1	46	30·22		1	51	~~22·29~~		1	37	34·49			
a		1	47	21·30		1	52	15·16		1	38	25·58			
Δ T				+ 51·08				+ 51·09				+ 51·09			

$n = +42.$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Jan 7									
Observer											
Illumin'n											
Star		Fr. 3242			Fr. 8421			8421			
Mag.											
δ											
Wire	a										
"	b										
"	c										
"	1	22	34	34·2	22	36	14·8	23	1	17·9	
"	2			39·2			19·9			23·0	
"	3			44·2			24 ~~23~~ ·7			27·9	
"	4			49·2			29·6			33·0	
"	5			54·3			34·7			~~37~~ 37·9	
"	d										
"	e										
"	f										
Sum											
Mean		22	34	44·22	22	36	24·74	23	1	27·94	
Red'n to m		22	35	36·52	22	37	17·04	23	2	20·24	
n. tan. δ		4	52	58·75	4	52	58·75	4	52	58·75	
c. sec. δ				17·92			17·64			13·53	
r		4	53	16·67	4	53	16·39	4	53	12·28	
T		3	28	53·89	3	30	33·43	3	~~54~~ 55	32·52 ~~40·22~~	
a		3	29	20	3	34	50	3	59	50	
Δ T				− 26·81			− 4 16·57			− 4 17·48	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Jan 9		
Observer		G.M.S		
Illumin'n				
Star		α Columbae	α Orionis	22 Camelop.
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	5 33 48·2	5 46 59·8	6 3 1·9
"	2	52·9	47 2·4	11·4
"	3	57·4	6·5	22·4
"	4	34 1·6	10·2	32·8
"	5	6·0	13·9	43·1
"	d			
"	e			
"	f			
Sum		286·1	32·8	111·6
Mean		5 33 57·22	5 47 6·40	6 3 22·32
Red'n to				
m		+35	+35	+35
n. tan. δ		−40	−20	+44
c. sec. δ		+85	+71	+2·00
r		+80	+86	+2·79
T		5 33 58·02	5 47 7·26	6 3 25·11
a		5 34 53·52	5 48 2·55	6 4 20·63
Δ T		+55·50	+55·29	+55·52

n = +25

ΔT = +55·44

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Jan 10		
Observer				
Illumin'n				
Star		Fr. 8421		
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	20	22	44.1
"	2			49.0
"	3			54.0
"	4			59.0
"	5			4.1
"	d			
"	e			
"	f			
Sum				
Mean		20	22	54.04
Red'n to m		20	23	50.30
n. tan. δ		4	41	11.07
c. sec. δ				39.50
τ		4	41	50.51
T		1	5	40.81
a		1	12	5
Δ T			6	29.19

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Jan 11			
Observer		E P A			
Illumin'n		W			
Star		ι Cassiop	γ Ceti	93 Ceti (~~wrong number~~) ζ Arietis	
Mag.					
δ					
Wire	a				
"	b				
"	c				$3^h\ 6^m$
"	1	2 16 56·2	2 35 21·8	2 54 21·9	12·8
"	2	~~5·2 14·8~~	25·4	25·6	16·4
"	3	14·8	29·3	29·3	20·6
"	4	23·2	32·8	32·8	24·1
"	5	33·0	36·5	36·6	28·0
"	d				
"	e				
"	f				
Sum		72·4	145·8	146·2	101·9
Mean		2 17 14·48	2 35 29·16	2 54 29·24	20·38
Red'n to					
m		+35	+35	+35	+35
n . tan. δ		+47	−28		−17
c . sec. δ		+1·77	+70	+70	+75
r		+2·59	+·77		+93
T		2 17 17·07	2 35 29·93		21·31
					3 7
a		2 18 15·11	2 36 27·98	2 55 23·19	19·60
Δ T		+58·04	+58·05		+58·29

n + 32
ΔT = +58·13 at $2^h\ 30^m$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Jan 17		
Observer		E P A		
Illumin'n		W		
Star		5 Urs. Min L.C. ~~48 Cephei~~	γ Ceti ~~5 48 Cephei~~	48 Cephei ~~γ Ceti~~
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	2 26 13·5	2 35 11·9	3 1 56·7
"	2	28·7	15·1	2 13·1
"	3	44·3	18·9	31·1
"	4	59·1	22·3	46·3
"	5	27 13·9	26·1	3 2·2
"	d			
"	e			
"	f			
Sum		219·5	94·3	149·4
Mean		14 26 43·90	2 35 18·86	3 2 29·88
Red'n to				
m		+25	+25	+25
n . tan. δ		−2·86	−48	+1·96
c . sec. δ		−2·95	+70	+3·17
r		−5·56	+47	+5·38
T		14 26 38 34	2 35 19·33	3 2 35·26
a		14 27 47·18	2 36 27·90	3 3 44·02
Δ T		+1 8·74	+1 8·57	+1 8·76

$n = +.56$
$\Delta T = +1^m\ 8^s.66$ at $2^h 45^m$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date				
Observer				
Illumin'n				
Star		ζ Arietis	Fr. 3242 8421	Fr. 8421 3242
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	3 6 2·7	4 22 3·1	4 20 44·8
"	2	6·2	8·1	49·7
"	3	10 3	13·3	54·7
"	4	14·1	18·1	59·6
"	5	18·0	23·1	21 4·7
"	d			
"	e			
"	f			
Sum		51·3		
Mean		3 6 10·26	4 22 13·14	
Red'n to				
m		+25	4 23 21·91	
n. tan. δ		−30	4 9 43·72	
c. sec. δ		+75	3 10·85	
r		+70	4 13 0·57	
T		3 6 10·96	8 36 22·48	
a		3 7 19·52	8 36 50 − 27·52	
Δ T		+ 1 8·56	~~25·28~~	

Chron. 236 4 32 5
Clock. 4 30 38·58 6 comparisons.
Corr. to Clock + 1 8·66

Corr. to Chron −17·76

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Jan 30								
Observer		E P A								
Illumin'n		E								
Star		ε Orionis			ψ¹ Drac. for L C.			α Orionis		
Mag.										
δ										
Wire	a									
"	b									
"	c									
"	1	5	27	55·2	5	42	17·8	5	48	11·9
"	2			58·4			30·1			17·2
"	3		28	2·0			42·3			22·3
"	4			5·8			53·8			27·3
"	5			9·5		43	5·2			32·6
"	d									
"	e									
"	f									
Sum				10·9			209·2			111·3
Mean		5	28	2·18	5	42	41·84	5	48	22·26
Red'n to m				+37			+37			+37
n . tan. δ				−21			−93			−18
c . sec. δ				−74			+2·42			−75
r				−58			+1·86			−56
T		5	28	1·60	5	42	43·70	5	48	21·70
a		5	29	31·79	17	44	14·17	5	48	2·48
ΔT			+1	30·19		+1	30·47		+1	30·78

n = +.23 from ψ¹ Drac L b & 22 Camel.

ΔT = +1 30·43 at 5ʰ 30ᵐ

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date							
Observer							
Illumin'n							
Star		22 Camelop			β Tauri		
Mag.							
δ							
Wire	a						
"	b						
"	c						
"	1	6	2	30·3	5	16	19·8
"	2			41·1			24·1
"	3			51·0			28·1
"	4		3	1·8			32·6
"	5			12·0			36·4
"	d						
"	e						
"	f						
Sum				256·2			141·6
Mean		6	2	51·24	5	16	28·20
Red'n to							+37
m				+37			~~−84~~
n. tan. δ				+40			−09
c. sec. δ				−2·11			−84
r				−1·34			−56
T		6	2	49·90	5	16	27·64
a		6	4	20·36	5	17	57·87
Δ T			+1	30·46		+1	30·23

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Feb 3								
Observer		E. P. A.								
Illumin'n		E								
Star		η Tauri			ζ Ursæ Min. LC			γ' Eridani		
Mag.										
δ										
Wire	a									
"	b									
"	c									
"	1	3	37	54·0	3	46	31·0	3	50	8·7
"	2			58·1			[48·7]			12·1
"	3			1·9		47	6·4			16·1
"	4			5·9			23·0			19·9
"	5			9·7			40·3			23·4
"	d									
"	e									
"	f									
Sum				9·6			29·4			80·2
Mean		3	38	1·92	3	47	5·88	3	50	16·04
Red'n to										
m				+26			+26			+26
n. tan. δ				−04			− 46			− 09
c. sec. δ				− 81			+3·62			−76
r				− 59			+3·42			−59
T		3	38	1·33	15	47	9·30	3	50	15·45
a		3	39	38·87	15	48	46·84	3	51	52·52
ΔT			+ 1	37·54		+ 1	37·54		+ 1	37·07

n = +·08

ΔT = + 1 37·46

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date						
Observer						
Illumin'n						
Star		γ Tauri			ζ Persei	
Mag.						
δ						
Wire	a					
"	b					
"	c					
"	1	4	10	33·0	3 44	5·4
"	2			36·8		9·4
"	3			40·6		13·8
"	4			44·5		18·2
"	5			48·1		22·3
"	d					
"	e					
"	f					
Sum				203·0		69·1
Mean		4	10	40·60	3 44	13·82
Red'n to						
m				+26		+ 26
n . tan. δ				−05		− 02
c . sec. δ				−77		− 87
r				−56		~~− 59~~ − 63
T		4	10	40·04	3 44	13·19
a		4	12	17·50	3 45	50·86
Δ T			+ 1	37 46	+ 1	37·67

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Feb 11								
Observer		EPA								
Illumin'n		E								
Star		γ Geminorum			50 Draconis L.C. ε Can Maj			ε Can Maj.		
Mag.										
δ										
Wire	a									
"	b									
"	c									
"	1	6	28	3·0	6	48	6·2	6	51	24·1
"	2			6·6			21·0			28·3
"	3			10·3			35·1			32·4
"	4			14·2			49·2			36·3
"	5			18·2		49	2·8			40·6
"	d									
"	e									
"	f									
Sum				52·3			174·3			161·7
Mean		6	28	10·46	6	48	34·86	6	51	32·34
Red'n to										
m				+25			+25			+25
n. tan. δ				−14			−99			−31
c. sec. δ				−77			+2·91			−83
r				−66			+2·17			−89 ~~−77~~
T		6	28	9·80	6	48	37·03	6	51	31·45
a		6	30	6·14	18	50	33·35	6	53	27·61
ΔT		+	1	56·34	+	1	56·32	+	1	56·16

n = +·21 from γ Gem. & 50 Drac

ΔT = + 1 56·27

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Feb 16		
Observer		E P A		
Illumin'n		E		
Star		α Tauri	α Camelop.	11 Orionis
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	4 28 9·8	4 40 36·2	4 56 50·7
"	2	13·4	45·4	54·4
"	3	17·2	54·0	58·0
"	4	21·0	41 3·1	57 2·0
"	5	24·9	12·1	5·8
"	d			
"	e			
"	f			
Sum		86·3	270·8	290·9
Mean		4 28 17·26	4 40 54·16	4 56 58·18
Red'n to				
m		+ 43	+ 43	+ 43
n . tan. δ		− 22	+ 53	− 25
c . sec. δ		− 78	− 1·83	− 77
r		− 57	− 87	− 59
T		4 28 16·69	4 40 53·29	4 56 57·59
a		4 28 21·29	4 40 57·90	4 57 2·23
Δ T		+ 4·60	+ 4·61	+ 4·64

$n = +.39$

$\Delta T = +4.62$ at $4^h\ 45^m$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Feb 16						
Observer								
Illumin'n								
Star		Fr. 8421				3242		
Mag.								
δ								
Wire	a							
"	b							
"	c	9	1	21.5				
				26.4				
"	1			31.2	9	4	38.1	
"	2			36.6			43.1	
"	3			41.7			48.1	
"	4			46.8			53.1	
"	5			51.8			58.1	
				56.9				
"	d		2	1.8				
"	e			6.8				
"	f			11.6				
				16.6				
Sum				21.6				
Mean		9	1	51.75	9	4	48.10	
Red'n to		9	1	56.67	9	4	53.02	
m			11	46.46				
n. tan. δ		2	~~7~~	~~50.56~~	2	11	46.46	
c. sec. δ			2	31.21		2	30.72	
r		2	14	19.67	2	14	17.18	
T		11	16	14.34	11	19	10.20	
a.		11	15	40.	11	19	40	
Δ T				+ 34.34			− 29.80	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Feb 20		
Observer		S M S		
Illumin'n		E		
Star		ε Hydrae	σ² Ursæ Maj	1 Draconis
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	8 39 29·5	8 58 15·9	9 17 5·3
"	2	33·1	25·7	32·9
"	3	36·8	34·7	57·3
"	4	40·4	44·5	18 24·6
"	5	44·0	54·0	48·9
"	d			
"	e			
"	f			
Sum		183·8	174·8	269·0
Mean		8 39 36·76	8 58 34·96	9 17 57·80
Red'n to		1		
m		+43	+43	+43
n. tan. δ		−41	+79	+3·18
c. sec. δ		−75	−1·94	−5·26
r		−73	−72	−1·65
T		8 39 36·03	8 58 34 24	9 18 56·15
a		8 39 48·31	8 58 46·81	9 18 8·15
Δ T		+12·28	+12·57	+12·00

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date	Feb 20		
Observer	GMS		
Illumin'n	E		
Star	α Hydrae	9 Ursæ Maj	
Mag.			
δ			
Wire a			
" b			
" c			
" 1	9 20 48·7	9 23 38·8	
" 2	52·3	44·8	
" 3	55·9	50·7	
" 4	59·8	56·5	
" 5	21 3·2	24 2·3	
" d			
" e			
" f			
Sum	279·9	253·1	
Mean	9 20 55·98	9 23 50·62	
Red'n to			
m	+ 43	+ 43	
n . tan. δ	− 54	+ 20	
c . sec. δ	− 75	− 1·22	
r	− 86	− 59	
T	9 20 55·12	9 23 50·03	
a	9 21 7·44	9 24 2·30	
Δ T	+ 12·32	+ 12·27	

n = + 52 from mean of circumpolars & mean of time stars.

ΔT = + 12·29 at $9^h\ 0^m$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Feb 20						
Observer								
Illumin'n								
Star		Fr. 8421			Fr. 3242			
Mag.								
δ								
Wire	a							
"	b							
"	c							
"	1	9	10	5·7	9	11	7·2	
"	2			10·8			12·2	
"	3			16·0			17·2	
"	4			21·1				
"	5			26·1			27·2	
"	d							
"	e							
"	f							
Sum								
Mean		9	10	15·94	9	11	17·20	
Red'n to m		9	10	28·23	9	11	29.49	
n. tan. δ		1	56	2·83	1	56	2·83	
c. sec. δ			2	29·80		2	29·65	
r		1	58	32·63	1	58	32·48	
T		11	9	0·86	11	10	1·97	
a		11	8	30	11	10	30	
Δ T				~~29·14~~ +30·86			−28·03	

Feb

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Feb 23		
Observer		E P. A		
Illumin'n		E		
Star		δ Can Maj	δ Gemmorum	P VII 67
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	7 2 37.5	7 11 50.3	7 16 32.5
"	2	41.8	54.1	42.7
"	3	45.4	58.0	52.3
"	4	49.7	12 2.0	17 2.9
"	5	53.8	5 8	12.6
"	d			
"	e			
"	f			
Sum		228.2	290.2	263.0
Mean		7 2 45.64	7 11 58.04	7 16 52.60
Red'n to				
m		+ 40	+ 40	+ 40
n. tan. δ		− 52	− 18	+ 68
c. sec. δ		− 83	− 80	− 2.04
r		− .95	− .58	− 1.03
T		7 2 44.69	7 11 57.46	7 16 51.57
a		7 3 2.60	7 12 15.29	7 17 9.45
Δ T		+17.91	+ 17.83	+ 17.88

n = + 37 from P VII 67 and mean of the others

ΔT = + 17.87 at 7h 15m

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		~~Feb~~ Feb 22			Feb 23			Feb 25		
Observer										
Illumin'n										
Star		East Clock			East Clock			East Clock		
Mag.										
δ										
Wire	a									
"	b									
"	c									
								7	7	49·83
"	1	9	6	40·9	9	24	38·2			51 85
"	2		7	41·1		25	38·4			53·85
"	3		8	41·2		26	38·7			55·88
"	4		9	41·4		27	38·9			57 88
"	5		10	41·5		28	39·0		7	~~59 95~~
"	d									
"	e									
"	f									
Sum										
Mean		9	8	41·22	9	26	38·64	7	7	53·86
Red'n to m		9	8	57 35	9	26	56·68	7	8	15·50
n. tan. δ		1	48	11·01	1	46	15·10	1	36	23·30
c. sec. δ			2	30·06		2	27·11		2	49·83
r		1	50	41·07	1	46	42·21	1	39	13·13
T		10	59	~~38·42~~ 0	11	13	38·89	8	47	28·63
				4			4			xx
a		11	0	~~8~~	11	14	~~8~~	8	47	~~57~~ ...
Δ T				~~23·58~~ ~~36·42~~ 25·58			~~23·11~~ ~~36·89~~ 25·11			~~23·37~~ 25·37

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Feb 25		
Observer		E P A		
Illumin'n		E		
Star		δ Can Maj	δ Geminorum	τ Draconis 2C.
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	7 2 33·6	7 11 46·1	7 17 13·2
"	2	37·8	50·1	26·1
"	3	41·7	54·0	38·4
"	4	46·0	58·0	50·8
"	5	49·9	12 1·6	18 2·5
"	d			
"	e			
"	f			
Sum		209·0	269·8	191·0
Mean		7 2 41·80	7 11 53·96	7 17 38·20
Red'n to				
m		+40	+40	+40
n . tan. δ		−28	−10	−84
c . sec. δ		−83	−80	+2·55
r		−71	−50	+2·11
T		7 2 41·09	7 11 53·46	7 17 40·31
a		7 3 2·57	7 12 15·26	19 18 1·95
Δ T		+21·48	+21·80	+21·64

n = +.20 from τ Draconis and mean of the others

ΔT = +21·64

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Feb 28			
Observer					
Illumin'n					
Star		East Clock			
Mag.					
δ					
Wire	a				
"	b				
"	c				
"	1	7	17	~~59~~ 49.4	
"	2		18	49.7	
"	3		19	49.8	
"	4		20	50.0	
"	5		21	50.1	
"	d				
"	e				
"	f				
Sum					
Mean		7	19	49.80	
Red'n to					
m		7	20	~~17.98~~ 17.82	17.11
n. tan. δ		1	24	35.58	
c. sec. δ			2	47.86	
r		1	27	23.44	
				55	
T		8	47	40.~~42~~	
a		8	48	0	
				45	
Δ T				- 19.~~37~~	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Feb 28		
Observer		E P A		
Illumin'n		E		
Star		Gr. 966	δ Orionis	α Leporis
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	5 21 13.1	5 24 42.7	5 26 21.1
"	2	27.7	46.2	25.0
"	3	41.1	49.7	28.7
"	4	55.3	53.4	32.3
"	5	22 9.8	56.9	36.3
"	d			
"	e			
"	f			
Sum		207.0	248.9	143.4
Mean		5 21 41.40	5 24 49.78	5 26 28.68
Red'n to				
m		+40	+40	+40
n . tan. δ		+1.21	~~+~~40	−53
c . sec. δ		~~−2.85~~	−74	−78
r		−1.24	−74	−91
T		5 21 40.16	5 24 49.04	5 26 27.77
a		5 22 7.34	5 25 16.24	5 26 54.94
Δ T		+27.18	+27.20	+27.17

n = +43 from Gr. 966 & mean of the others

ΔT = +27.18 at $5^h 30^m$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Mar 5									
Observer		E P A									
Illumin'n		E									
Star		44 Gemin				ε Hydrae			σ^2 Ursæ Maj		
Mag.											
δ											
Wire	a										
"	b										
"	c										
"	1	7	44	40·4	8	39	3·5	8	57	50·5	
"	2			44·3			7·1		58	0·3	
"	3			48·2			10·8			9·5	
"	4			52·5			14·2			19·3	
"	5			56·4			18·0			28·6	
"	d										
"	e										
"	f										
Sum				241·8			53·6			48·2	
Mean		7	44	48·36	8	39	10·72	8	58	9·64	
Red'n to m				+30			+30			+30	
n. tan. δ				−10			−20			+40	
c. sec. δ				−84			−75			−1·94	
r				−64			−65			−1·24	
T		7	45	47·72	8	39	10·07	8	58	8·40	
a		7	45	25·97	8	39	48·23	8	58	46·62	
Δ T				+38 25			+38·16			+38·22	

n = +26 from σ^2 Ursæ Maj & mean of the others

$\Delta\pi$ = +38·21 at $8^h\,30^m$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Mar 12							Mar 8		
Observer											
Illumin'n											
Star		Gr. 3242			East clock				East clock		
Mag.											
δ											
Wire	a										
"	b										
"	c										
"	1	0	47	50·0	0	49	32·4	22	4	56·6	
"	2			55·0			34·4			58·6	
"	3		48	0·1							
"	4			[5·2]			38·4		5	2·6	
"	5			10·0			40·4			4·6	
							42·5			6·6	
"	d										
"	e										
"	f										
Sum											
Mean		0	48	0·02	0	49	36·42	22	5	0·60	
Red'n to		0	48	54·04	0	50	30·44	22	5	47·23	
m		0	33	28·80	0	33	28·80	0	49	12·43	
n. tan. δ			3	52·00		33	51·73			22·81	
c. sec. δ											
									49	35·24	
r		0	37	20·80	0	37	20·53	0	~~53~~	~~30·14~~	
T		1	26	14·84	1	27	50·97	22	55	22·47	
									55		
a		1	26	0	1	27	0	22	~~58~~	0	
										+ 22·47	
Δ T				+ 14·84			+ 50·97			~~+37·53~~	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Mar 11	Mar 11	Mar 11
Observer		E P A		
Illumin'n		W		
			J y C 1879 LC	
Star		ι Urs Maj	~~κ Cancri~~	κ Cancri
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	8 49 5.7	8 51 58.7	8 59 36.7
"	2	11.2	52 18.6	40.1
"	3	17.0	38.1	44.1
"	4	22.0	53 0.0	47.7
"	5	28.0	20.6	59 51.1
"	d			
"	e			
"	f			
Sum		83.9	196.0	219.7
Mean		8 49 16.78	8 52 39.20	8 59 43.94
Red'n to				
m		+30	+30	+30
n. tan. δ		+10	+ 3.04	−33
c. sec. δ		~~+~~ 96	− 3.71	+ 65
r		+1.36	− 6.45	+62
T		8 49 18.14	8 52 32.75	8 59 44.56
a		8 50 10.73	20 53 25.19	9 0 36.85
Δ T		+ 52.59	+ 52.44	+ 52.29

n = + 46 from J y C 1879 & mean of the others.

ΔT = + 52.44 at 8 50

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Mar 14					
Observer		E P A					
Illumin'n		W					
Star		ε Pegasi					
Mag.							
δ							
Wire	a						
"	b						
"	c						
"	1	21	36	34·9	21	34	4·3
"	2			38·5			6·3
"	3			42·1			
"	4			45·6			10·3
"	5			49·3			12·3
							14·3
"	d						
"	e						
"	f						
Sum				210·4			
Mean				42·08	21	34	8·30
Red'n to							
m				+30	21	35	6·94
n. tan. δ				−35	0	29	32·89
c. sec. δ				+65			27·83
r				+60	0	30	0·72
T		21	37	42·68	22	5	7·66
a		21	37	41·32	22	4	0
Δ T				+58·64		+1	7·66

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Mar 19		
Observer				
Illumin'n				
Star		ι Ursæ Majoris	α Hydræ	24 Ursæ Majoris
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	8 48 46.6	9 19 47.7	9 21 11.1
"	2	52.0	51.2	22.5
"	3	57.5	54.9	33.1
"	4	49 3.0	58.6	43.5
"	5	8.2	20 2.1	54.7
"	d			
"	e			
"	f			
Sum		287.3	274.5	164.9
Mean		8 48 57.46	9 19 54.90	9 21 32.98
Red'n to m		+30	+30	+30
n. tan. δ		+06	−28	+51
c. sec. δ		+1.12	+75	+2.20
r		+1.48	+77	+3.01
T		8 48 58.94	9 19 55.67	9 21 35.99
a		8 50 10.59	9 21 7.28	9 22 47.62
Δ T		+1 11.65	+1 11.61	+1 11.63

n = +27 from 24 Ursæ Majoris & mean others

ΔT = +1 11.63

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Mar 19							
Observer		E P A							
Illumin'n		W							
Star		Fr. 3242			East Clock				
Mag.									
δ									
Wire	a								
"	b								
"	c								
"	1	8	32	52.0	8	34	50.40		
"	2			56.9			52.41		
"	3		33	2.0					
"	4			7.0			56.40		
"	5			12.0			58.40		
						35	0.40		
"	d								
"	e								
"	f								
Sum									
Mean		8	33	1.98	8	34	54.40		
Red'n to		8	34	13.56	8	36	5.98		
m̄		0	5	57.45	0	5	57.45		
n. tan. δ			2	35.94		2	35.64		
c. sec. δ									
r		0	8	23.39	0	8	33.09		
			42	46.95		44	39.07		
T		8	~~41~~	~~35 37~~	8	~~43~~	~~27.49~~		
a		8	42	35	8	44	0		
Δ T			+	11.95			+ 39.07		

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Mar 23		
Observer		E P A		
Illumin'n		W		
Star		1 Draconis	α Hydrae	9 Urs Maj
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	9 15 47·3	9 19 38·5	9 22 27·8
"	2	16 12·3	42·1	33·8
"	3	38·9	46 45·0	39·8
"	4	17 3·2	49·4	45·8
"	5	29·7	53·1	51·8
"	d			
"	e			
"	f			
Sum		191·4	229·1	
Mean		9 16 38·28	9 19 45·82	9 22 39·80
Red'n to				
m		+ 30	+ 30	+ 30
n. tan. δ		+ 1·72	− 29	+ 11
c. sec. δ		+ 5·26	+ 75	+ 1·22
r		+ 7·28	+ 76	+ 1·63
T		9 16 45 56	9 19 46·58	9 22 41·43
a		9 18 6·19	9 21 7·24	9 24 1·98
Δ T		+ 1 20·63	+ 1 20·66	+ 1 20 55

m = + 28 from 1 Drac. and mean of the others

ΔT = + 1 20·61 at 9 20

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Mar 23					
Observer							
Illumin'n							
Star		East clock		Fr. 3242			
Mag.							
δ							
Wire	a						
"	b						
"	c						
"	1	9	47	13·7	9	51	43·3
"	2		48	13·9			48·3
"	3		49	14·0			53·3
"	4		50	14·1			58·4
"	5		51	14·3		52	3·5
"	d						
"	e						
"	f						
Sum							
Mean		9	49	14·00	9	51.	53:36
Red'n to		9	50	34·66	9	52	14·02
m							
n. tan. δ		~~23 0~~	~~50 5~~	13·83	23	50	13·83
c. sec. δ			2	23·24		2	22·~~97~~ 81
r		9	43	11·73	9	45	50·~~82~~ ·66
T							
a		9	42	2	9	45	40
Δ T			+1	9·73			+10·66

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Mar 24
Observer		
Illumin'n		
Star		α Ursæ Majoris
Mag.		
δ		
Wire	a	
"	b	
"	c	
"	1	10 55 17.0
"	2	25.4
"	3	33.7
"	4	41.2
"	5	49.2
"	d	
"	e	
"	f	
Sum		166.5
Mean		10 55 33.30
Red'n to		
m		+47
n . tan. δ		+14
c . sec. δ		+1.60
τ		+2.21
T		10 55 35.51
a		10 55 35.34
Δ T		−0.17

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Mar 25		
Observer		E P A		
Illumin'n		W		
Star		α Persei	γ² Urs Min LC	η Tauri
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	3 14 40·9	3 20 38·2	3 39 28·7
"	2	46·7	49·7	32·2
"	3	52·1	21 0·9	36·7
"	4	57·4	14·0	40·3
"	5	15 3·2	25·7	44·6
"	d			
"	e			
"	f			
Sum		260·3	8·5	182·5
Mean		3 14 52·06	3 21 1·70	3 39 36·50
Red'n to				
m̄		+47	+47	+47
n . tan. δ		+0·4	−5·7	−0·7
c . sec. δ		+1·14	−2·44	+81
r		+1·65	−2·54	+1·21
T		3 14 53·71	3 20 59·16	3 39 37·71
a		3 14 53·96	15 20 59·41	3 39 37·98
Δ T		+0·25	+0·25	+0·27

$n = -.14$

$\Delta T = +0.26$ at $3^h\ 30^m$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date				
Observer Illumin'n				
Star Mag. δ				
Wire a " b " c " 1 " 2 " 3 " 4 " 5 " d " e " f				
Sum Mean				
Red'n to m n . tan. δ c . sec. δ				
τ				
T a Δ T				

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date

Observer
Illumin'n

Star
Mag.
δ

Wire a
" b
" c

" 1
" 2
" 3
" 4
" 5

" d
" e
" f

Sum
Mean

Red'n to
$\bar{m}$
n . tan. δ
c . sec. δ

τ

T

a

Δ T

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date 1868		March 31		
Observer		E Post		
Illumin'n		W		
Star		ε Herculis	ι Ursae Maj	κ Cassiop
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	8 39 33.0	8 49 50.9	9 0 21.8
"	2	36.5	56.2	25.3
"	3	40.3	50 2.2	29.1
"	4	43.9	7.5	32.4
"	5	47.6	13.0	36.4
"	d			
"	e			
"	f			
Sum				
Mean		39 40.26	50 1.96	0 29.10
Red'n to				
m		+ 61	61	61
n. tan. δ		+ 12	+ 1.19	+ 21
c. sec. δ		− 06	−07	−12
r		+ 1.67	+ 1.73	+ 70
T		39 40 93	50 3.69	0 29.80
a		8 39 47.90	8 50 10.33	9 0 36.61
Δ T		6.97	6.64	6.81

Assumed $c = +0.64$
$n' = +1.05$
$m' = +0.61$

at $9^h\ 9^m$ S. Clock $6^s.89$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date				
Observer				
Illumin'n				
Star		ζ Hydrae	24 Ursae Maj. ε Leonis	
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	9 21 52.2	9 22 15.3	9 38 6.7
"	2	56.0	26.0	10.7
"	3	59.9	37.2	14.6
"	4	22 3.1	48.3	18.5
"	5	7.1	59.2	22.5
"	d			
"	e			
"	f			
Sum				
Mean		21 59.66	22 37.20	38 14.60
Red'n to				
m		+ 61	+ 61	+ 61
n . tan. δ		− 15	+ 2.95	+ 47
c . sec. δ		+.10	−.52	−.23
r		+ 56	+3.04	+ 85
T		22 0 22	40 24	15 45
a		9 22 7.13	9 22 47.15	9 38 22.30
				45
Δ T		6.91	6.91	6.85

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date 1868	April 14	April 14		
Observer	E Ped	E Ped		
Illumin'n	K	K		
Star	11 Capricorni 26	4 Geminiorum	6 Draconis 26	
Mag.				
δ				
Wire a				
" b				
" c				
" 1	9 39 31.4	7 45 8.8	7 48 10.1	
" 2	42.9	12.9	21.4	
" 3	53.7	16.9	31.1	
" 4	40 4.7	20.9	42.2	
" 5	15.8	25.0	53.1	
" d				
" e				
" f				
Sum		84.5	157.9	
Mean	39 53.70	7 45 16.90	7 48 31.58	
Red'n to				
m	+.61	+.55	+.35	
n. tan. δ	−1.99	−.19	−1.72	
c. sec. δ	−74	+0.71	−1.87	
r	−3.12	+.87	−3.24	
T	50.58	7 45 17.77	28.34	
a	21 39 57.47	7 45 25.49	19 48 36.08	
Δ T	6.89	7.72	7.74	

c = +0.64
m = +0.47
m = +0.35

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date				
Observer				
Illumin'n				
Star		3 Ursae Maj.	15 Argus	1 Hydrae
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	7 59 8.0	8 1 40.0	9 20 51.7
"	2	18.4	44.0	58.2
"	3	28.6	48.1	59.0
"	4	38.3	51.8	62.7
"	5	48.8	55.8	66.1
"	d			
"	e			
"	f			
Sum		2.1	39.7	44.7
Mean		7 59 28.42	8 1 47.94	9 20 58.94
Red'n to				
m		+ 35	+ 35	+ 35
n . tan. δ		+ 79	− 63	− 44
c . sec. δ		+ 1.77	+ 70	+ .65
r		+2.91	+.42	+ 51
		7 59 31.33	48 36	59 45
T				
a		7 59 39.31	8 1 56.16	9 21 7.12
Δ T		7.98	7.80	7.67

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date				
Observer				
Illumin'n				
Star		24 Umedlg + Leonis		11 Canfrieide
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	9 22 14.8	9 38 5.6	9 39 31.0
"	2	25.5	9.6	42.0
"	3	36.6	13.8	53.1
"	4	46.9	17.5	40 3.9
"	5	58.1	21.5	15.0
"	d			
"	e			
"	f			
Sum		31.9	68.0	15.0
Mean		9 22 36.38	9 38 13 60	9 39 53,00
Red'n to				
m		+ 35	+ 35	+ 35
n . tan. δ		+ 89	+ 22	- 1,77
c . sec. δ		+ 1.91	+ 1.70	- 1.94
τ		+ 3.15	+ 0.83	- 3.36
		39.53	14.83	49.64
T			14.43	
a		9 22 47.10	9 38 22.29	21 39 57.53
Δ T		7.57	7.86	7.89

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date	1868 April 3			
Observer	E.P.A			
Illumin'n				
Star	ε Hydrae	J.Y.C 1879		κ Cancri
Mag.				
δ				
Wire a				
" b				
" c				
" 1	8 39 32.6 ~~32.6~~	8 52 44.3	9 0 21.0	
" 2	36.0	56 6.2	24.8	
" 3	39.9	26.1	28.6	
" 4	43.4	47.3	32.0	
" 5	47.0	57 9.0	35.8	
" d				
" e				
" f				
Sum	158.9	29	142.2	
Mean	39.78	8 56 26.58	9 0 28.44	
Red'n to m	+ 35	35	+ 35	
n. tan. δ	−.40	− 337	− 36	
c. sec. δ	+0.65	− 371	+0.65	
r	+ 60	− 673	+ 66	
T	40.38	19.85	29.10	
a	8h 39m 47.s86	20h 53m 27.s44	9h 0m 36.s57	
Δ T	7.38	7.59	7.47	

7.48
59
47
62
61
7.77
7.55
− 07 change of all
7.48

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date			
Observer			
Illumin'n			
Star		α Hydrae	24 Ursæ Majoris
Mag.			
δ			
Wire	a		
"	b		
"	c		
"	1	9 20 57.8	9 22 14.5
"	2	55.3	25.1
"	3	59.0	36.5
"	4	21 2.6	46.9
"	5	6.3	57.9
"	d		
"	e		
"	f		
Sum		45.0	30.9
Mean		9 20 59.0	9 22 36.18
Red'n to			
m		+ 35	+ 35
n . tan. δ		− .53	+ .97
c . sec. δ		+0.65	+1.91
r		+ 47	+3.23
T		5-9 47	22 39 41
a		9h 21m 7.09	9 22 47.02
Δ T		7.62	7.61

n = +0.51

δ Black Clock 7.48 at 9h 0m

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Apr. 3.	Apr 3	Apr 3
Observer		EPA		
Illumin'n				
Star		E. Clock	Prod. 3242	Prod 3424
Mag.				
δ				
Wire	a			
"	b			
"	c			
Sid Clock times		$10^h\ 31^m\ 48^s.2$	$10^h\ 42^m\ 22.0$	10 44 14.3
"	2	32 48.4	27.1	19.3
"	3	33 48.6	31.9	24.2
"	4	34 48.7	37.2	29.3
"	5	35 48.9	42.2	34.0
"	d			
"	e			
"	f			
Sum				
Mean		10 33 48.56	10 42 32.08	10 44 24.22
Error. S. Clock		+ 7.48		
Red'n to		10 33 56.04	10 42 39.56	10 44 31.70
Sid t mean noon		49 9.14		
n. tan. δ		9 44 46.85	9 53 30.37	9 55 22.51
Sid to Mean time c. sec. δ		1 35.80	1 37.23	1 37.54
True time		9 43 11.05	9 51 53.14	9 53 44.97
Time beg & Clock		9 44 2	9 52 40.	9 54 50
a				
Δ T		− 50.95	− 44.86	$-1^m\ 5^s.03$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Apr 3.
Observer		
Illumin'n		
Star		Arnold 424.
Mag.		
δ		
Wire	a	
"	b	
"	c	
"	1	10h 39m 49.7
"	2	54.6
"	3	59.8
"	4	64.6
"	5	69.7
"	d	
"	e	
"	f	
Sum		10 39 54.68
Mean		
Red'n to		10 40 7.16
m		
n . tan. δ		
c . sec. δ		
r		~~10 40 35.00~~
T		10 40 35.00
a		
Δ T		— 27.84

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Apr 5						
Observer		E.P.A						
Illumin'n								
Star		6² Urs. Maj		κ Cancri		α Hydrae		
Mag.								
δ								
Wire	a	8h 58m 16s.4						
"	b							
"	c							
"	1	8h 58m 16s.4		9 00 21.6		9 20 52.2		
"	2	25.9		25.1		55.8		
"	3	35.8		29.2		59.7		
"	4	45.5		32.6		63.1		
"	5	55.2		36.3		67.0		
"	d							
"	e							
"	f							
Sum		8h 58m 35s.66		9 00 28.86		9 20 59.46		
Mean								
Red'n to								
m̄	+	.42	+	.42	+	.42		
n . tan. δ	+	1.67	+	.65	+	.65		
c . sec. δ	+	.78	−	.36	−	.54		
τ		~~58 38.43~~						
T		8 58 38.53		9 00 29.57		9 20 59.99		
a		8 58 45.51		36.54		67.07		
Δ T	+	6.98		6.97		7.08		

At 9h 14m ΔT = + 7.00

Rate = −.24

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date				
Observer				
Illumin'n				
Star		24 Ursæ Maj	ε Leonis	E. Clock
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	9 22 15·0	9 38 6·5	10 3 23·7
"	2	25·2	10·5	4 23·9
"	3	37·5	14·4	5 24·0
"	4	47·0	18·3	6 24·2
"	5	58·3	22·3	7 24·4
"	d			
"	e			
"	f			
Sum				5
Mean		9 22 36·60	9 38 14·40	10 5 24·04
				6·99
Red'n to				10 5 31·03
m		+ 42	+ 42	57 5·17
n . tan. δ		+ 1·91	+ ·70	9 8 24·86
c . sec. δ		+ 97	− 23	1 29·85
r				9 6 55·01
T		9 22 39·90	9 38 15·29	9 8 2·00
a		46·93	22·23	
Δ T		7·07	6·94	− 66·99

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date 1868	April 17			
Observer	E. P. A.			
Illumin'n				
Star		α Hydrae	β Cephei	μ Leonis
Mag.				
δ				
Wire a				
" b				
" c				
" 1		$9^h 20^m 52^s.2$	$9^h 26^m 31^s.1$	$9^h 45^m 0^s.1$
" 2		56.0	41.9	4.2
" 3		57.8	52.9	8.4
" 4		21 3.3	27 3.0	12.3
" 5		7.0	14.1	16.3
" d				
" e				
" f				
Sum		48.3	13.0	41.3
Mean		9 20 49.66	9 26 52.60	9 45 8.26
Red'n to m				
n. tan. δ		− 29	− 102	−12
c. sec. δ		+ 65	− 1.87	+ 75
r				
T				
a		9 21 6.88	21 26 56.63	9 45 15.84
Δ T				

At $9^h 24^m$ $\Delta T = +6.52$

Rate since 5^h ~~.0067~~ −.0400

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		
Observer		
Illumin'n		
Star		α Leonis
Mag.		
δ		
Wire	a	
"	b	
"	c	
"	1	$10^h\ 1^m\ 6^s.3$
"	2	10.3
"	3	14.0
"	4	17.4
"	5	21.2
"	d	
"	e	
"	f	
Sum		192
Mean		10 1 13.84
Red'n to		
m		
n . tan. δ		− 20
c . sec. δ		+ 66
r		
T		
a		10 1 21.34
Δ T		

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date	1868 Apr. 13			
Observer	E. P. A			
Illumin'n				
Star		g Leonis	ι Aphei	χ Crateris
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	$10^h\ 25^m\ 37^s.7$	$10\ 44\ 36^s.7$	$10\ 53\ 7^s.2$
"	2	41.4	45.6	14.8
"	3	45.4	53.7	11.1
"	4	48.7	62.7	18.6
"	5	52.5	71.5	22.3
"	d			
"	e			
"	f			
Sum				
Mean		$10\ 25\ 45^s.14$	$10\ 44\ 54^s.04$	$10\ 53\ 14^s.80$
Red'n to m				
n . tan. δ		− .31	− 1.31	+
c . sec. δ		+ .65	+ 1.54	+ .67
r				
T				
a		$10\ 25\ 52^s.68$	$58^s.32$	
Δ T		+7.80	+7.13	

$m' + \Delta T = +7.13$ at $10^h\ 46^m$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Apr 13
Observer		E. P. A.
Illumin'n		
Star		α Urs. Maj.
Mag.		
δ		
Wire	a	
"	b	
"	c	
"	1	10 55 10·6
"	2	18·2
"	3	25·7
"	4	33·8
"	5	41·7
"	d	
"	e	
"	f	
Sum		
Mean		10 55 26·00
Red'n to m		
n . tan. δ		+ 43
c . sec. δ		+ 1·38
r		
T		
a		34·79
Δ T		+ 7·16

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Apr 17		
Observer		EPA		
Illumin'n				
Star		E. Clock	Arnold 424.	Fr. 3424
Mag.				Thermometer
δ				
Wire	a			
"	b			
"	c			
"	1	12 6 44·5	11 59 49·9	12 2 14·3
"	2	7 44·7	12 00 5·0	19·3
"	3	8 44·85	5·1	24·2
"	4	9 45·0	10·0	29·3
"	5	10 45·15		34·3
"	d			
"	e			
"	f			
Sum				
Mean		12 8 44·84	12 00 00·0	12 2 24·28
		1 44 24·81		1 44 24·81
Red'n to				
m		10 24 20·03		10 17 59·47
n. tan. δ		1 42·28		1 41·24
c. sec. δ		6·52	6·52	6·52
τ				
T		10 24 25·5	12 1 50·0	10 17 50·00
a	True time	10 22 44·27	12 00 6·52	10 16 24·75
Δ T		— 1m 17·73	— 103·48	— 85·25

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		April 22		
Observer				
Illumin'n				
Star	Fr. 3242	1 Draconis	2 Hydrae	
Mag.				
δ				
Wire a				
" b				
" c				
" 1	12 05 02.2	9 16 57.0	9 20 57.5	
" 2	7.3	17 22.4	57.1	
" 3	12.3	49.1	58.9	
" 4	17.1	18 14.9	21 2.7	
" 5	22.2	40.5	6.0	
" d				
" e				
" f				
Sum		243.9	44.2	
Mean	12 05 12.22	9 17 48.78	9 20 58.84	
	1 44 24.81			
Red'n to m	10 20 47.41			
n. tan. δ	1 41.70	+ 2 10	− 36	
c. sec. δ	6.52	+ 4.55	+ .65	
r				
T	10 20 50.00			
a	10 19 12.23	9 18 2.54	9 21 6.81	
Δ T	− 102.77			

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date				
Observer				
Illumin'n				
Star		24 Ursæ Majoris	δ Ursæ Majoris	ε Leonis
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	9 22 14.0	9 23 40.7	9 38 5.5
"	2	24.8	46.2	9.5
"	3	36.4	52.7	13.5
"	4	46.9	58.1	17.5
"	5	57.6	24 4.2	21.5
"	d			
"	e			
"	f			
Sum		29.7	51.9	
Mean		9 22 35.94	9 23 52.38	9 38 13.50
Red'n to m				
n . tan. δ		+ 65	+ 12	− 16
c . sec. δ		+ 1.91	+ 1.05	+ .70
r				
T				
a		9 22 46.04	9 24 1.25	9 38 21.98
Δ T				

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date				
Observer				
Illumin'n				
Star		9 Leonis		
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	10 25 36.9		
"	2	40.7		
"	3	44.3		
"	4	47.9		
"	5	51.6		
"	d			
"	e			
"	f			
Sum		21.4		
Mean		10 25 44.28		
Red'n to				
m				
n . tan. δ		− 25		
c . sec. δ		+ 64		
r				
T				
a		10 25 52.58		
Δ T				

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Apr 23	Apr. 23	Apr. 23
Observer		E.P.A		
Illumin'n				
Star		91 Leonis	γ Cephei	β Leonis
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1	11 29 57.2	11 33 19.7	11 42 4.5
"	2	30 0.8	35.7	8.3
"	3	4.4	51.4	12.1
"	4	7.7	67.2	16.0
"	5	11.8	82.7	19.8
"	d			
"	e			
"	f			
Sum		21.9	256.7	60.7
Mean		11 30 4.38	11 33 51.34	11 42 12.14
Red'n to				
m		+ .30	+ .30	+ .30
n. tan. δ		− .33	− 1.89	− .23
c. sec. δ		+ .64	− 2.82	+ .67
r				
T		11 30 5.29	46.93	12.88
a		11 30 12.78	23 33 54.77	11 42 20.76
Δ T		+ 7.79	+ 7.84	+ 7.88

ΔT at $11^h 35.^m5$ = + 7.84

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		April 23	April 23	A1
Observer		E.P.A.		
Illumin'n		W		
Star		γ Ursae Majoris	o Virginis	
Mag.		2.3	4.0	
δ		54° 25′	9° 27′	
Wire	a			
"	b			
"	c			
"	1	11 46 32.1	11 58 14.5	
"	2	38.4	18.0	
"	3	44.7	21.8	
"	4	50.8	25.5	
"	5	57.1	29.1	
"	d			
"	e			
"	f			
Sum		223.1	108.9	
Mean		11 46 44.62	11 58 21.78	
Red'n to m				
n . tan. δ				
c . sec. δ				
r				
T				
a		11 46 53.89	11 58 30.49	
Δ T				

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Apr 26.	Apr. 26	Apr. 26.
Observer		E. P. A.	E. P. A.	E. P. A.
Illumin'n		W	W.	
Star		λ Draconis	γ Cephei	Gr. 4163
Mag.				
δ		70° 2' Circumpolar	C. 76° 53'	C. 73° 40'
Wire	a			
"	b			
"	c			
"	1	11 [illegible] 05.5	11 33 20.1	11 47 54.7
"	2	12.2	35.6	48 7.3
"	3	23.2	51.2	19.2
"	4	33.6	67.5	33.0
"	5	44.3	83.6	45.9
"	d			
"	e			
"	f			
Sum		114.8	238.0	190.1
Mean		11 23 22.96	11 33 51.60	11 48 20.02
Red'n to m		+ .25	+ .25	+ .25
n. tan. δ		+ .80	− 2.22	− 1.84
c. sec. δ		+ 1.87	− 2.82	− 2.28
r				
T		11 23 24.88	11 33 46.81	11 48 16.15
a		11 23 33.61	54.62	25.18
Δ T		8.73	7.81	9.03

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Apr. 26	Apr. 26	Apr. 26
Observer		E. P. A.	E. P. A.	E. P. A.
Illumin'n		W		
Star		4 Draconis	δ Leonis	δ Cratéris
Mag.				
δ		C. 78° 20′	Time-star 21° 14′	S. 14° 3′ S.
Wire	a			
"	b			
"	c			
"	1	12 05 43.4	11 06 49.3	11 12 29.5
"	2	30.3	53.3	33.0
"	3	48.8	57.3	37.2
"	4	65.9	60.9	40.7
"	5	84.9	65.0	44.4
"	d			
"	e			
"	f			
Sum		243.3	285.8	184.8
Mean		12 05 48.66	11 06 57.16	11 12 36.96
Red'n to				
m		+ .25	+ .25	+ .25
n . tan. δ		+ 1.76	− .22	− .50
c . sec. δ		+ 3.17	+ .68	+ .65
r				
T		12 05 53.68	11 06 57.87	11 12 37.36
a		61.89	66.22	45.96
Δ T		8.11	8.35	8.60

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Apr 26	Apr. 26	Apr. 26
Observer		E. P. A.		
Illumin'n		W.		
Star		τ Leonis	91 Leonis	q Ursæ Maj.
Mag.				
δ		I. 3° 34′	I. 0° 5′ S.	I. 54° 25′
Wire	a			
"	b			
"	c			
		53·9		
"	1	11 20 57·6	11 29 56·5	11 46 31·7
"	2	21 01·2	30 0·0	37·9
"	3	04·7	3·8	44·4
"	4	08·3	7·6	50·5
"	5		12·2	56·9
"	d			
"	e			
"	f			
Sum		25·7	20·1	21·4
Mean		11 21 01·14	11 30 4·02	11 46 44·28
Red'n to				
m		+ 25	+ 25	+ 25
n. tan. δ		− 38	− 38	+ 29
c. sec. δ		+ ·64	+ ·64	+ 1·10
r				
T		11 21 1·87	11 30 4·53	11 46 45·83
a		10·16	12·76	53·85
Δ T		8·49	8·23	8·02

Δ T at 11ʰ 29ᵐ (Clock time) = + 8·39

Rate since 28ᵐᵒ = + ·18

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		Apr 26.				Apr. 26				Apr. 26				
Observer		E. P. A.				E. P. A.				E. P. A.				
Illumin'n														
Star		o Virginis				4 Draconis H.				η Virginis				
Mag.						4.5								
δ		7.	9°	27′			78°	20′			0°	3′		
Wire	a													
"	b													
"	c													
"	1	11	58	14.0		12	5	13.3		12	12	54.6		
"	2			17.7				30.2				58.0		
"	3			21.3				48.7			13	1.7		
"	4			24.9			6	5.9				5.2		
"	5			28.8				24.1				8.8		
"	d													
"	e													
"	f													
Sum				4.7				242.2				8.3		
Mean		11	58	21.34		12	5	48.44		12	13	1.66		
Red'n to														
m				+ 25										
n . tan. δ				− 32										
c . sec. δ				+ 65										
r														
T		11	58	21.82										
a				30.48		12	5	61.87		12	13	10.65		
Δ T				8.66										

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		April 27			April 28			April 28			
Observer		E. P. A.			E. P. A.			E. P. A.			
Illumin'n		W			W			W.			
Star		Polaris			α Ursae Majoris			8 Leonis			
Mag.											
δ		88° 36′			62° 27′			21° 14′			
Wire	a										
"	b										
"	c										
"	1	1	4	28.1	10	55	8.3	11	6	49.3	
"	2		6	56.1			16.7			53.1	
"	3		9	34.4			24.6			57.0	
"	4		11	54.0			32.0		7	0.8	
"	5		14	28.2			40.0			4.8	
"	d										
"	e										
"	f										
Sum				140.8			121.6			5.0	
Mean		1	9	28.16	10	55	24.32	11	6	57.00	
Red'n to											
m							+ .20			+ .20	
r. tan. δ							+ 36			− .18	
c. sec. δ							+ 1.38			+ .68	
r											
T					10	55	26.26	11	6	57.70	
a		1	9	38.42	10	55	34.53	11	7	6.20	
Δ T							8.27			8.50	

c = + .42
m = − .51

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		April 28			April 28			April 28			
Observer		E.P.A.			E.P.A.			E.P.A.			
Illumin'n		W.			W.			W.			
Star		o Cephei			τ Leonis			91 Leonis			
Mag.											
δ		67° 23′			3° 34′			0° 5′ S.			
Wire	a										
"	b										
"	c										
"	1				11	20	54.0	11	29	56.4	
"	2	11	12	57.5	11	20	57.7		30	0.1	
"	3		13	6.0		21	1.2			3.7	
"	4			16.3			4.9			7.2	
"	5			25.4			8.5			16.9	
"	d										
"	e										
"	f										
Sum							63			18.3	
Mean					11	21	12.6	11	30	3.66	
Red'n to m							+ 20			+ 20	
n. tan. δ							− 30			− 32	
c. sec. δ							+ 54			+ 64	
r											
T					11	21	18.0	11	30	4.18	
a		11	13	12.55	11	21	10.15	11	30	12.74	
Δ T							8.35			8.56	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		April 28	April 28	April 28
Observer		E. P. A.	E. P. A.	E. P. A.
Illumin'n		W.	W.	W.
Star		β Leonis	γ Ursae Majoris	Groombridge 4163
Mag.				
δ		15° 18′	54° 25′	73° 40′
Wire	a			
"	b			
"	c			
"	1	11 42 4.0	11 46 31.6	11 47 54.6
"	2	7.7	37.9	48 7.3
"	3	11.7	44.0	20.0
"	4	15.3	50.3	33.0
"	5	19.3	56.6	46.0
"	d			
"	e			
"	f			
Sum		58.0	220.4	100.9
Mean		11 42 11.60	11 46 44.08	11 48 20.18
Red'n to				
m		+ .20	+ .20	+ .20
n . tan. δ		+ 23	+ 17	− 154
c . sec. δ		+ .67	+ 1.10	− 2.28
r				
T		11 42 12.70	11 46 45.21	11 48 17.82
a		11 42 20.72	11 46 53.80	11 48 25.65
Δ T		8.48	8.29	9.09
		? 8.02	? 8.63	? 7.53

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		April 28	April 28	April 28
Observer		E. P. A.	E. P. A.	E. P. A.
Illumin'n		W.	W.	W.
Star		o Virginis	4 Draconis H	η Virginis
Mag.				
δ		9° 27′	78° 21′	Time 0° 4′
Wire	a			
"	b			
"	c			
"	1	11 58 14.0	12 5 12.2	12 12 54.4
"	2	17.6	29.8	58.0
"	3	21.4	48.7	13 1.7
"	4	24.9	6 5.6	5.3
"	5	28.7	24.0	9.0
"	d			
"	e			
"	f			
Sum		106.6	240.3	8.4
Mean		11 58 21.32	12 5 48.06	12 13 1.68
Red'n to				
m		+ .20	+ .20	+ .20
n tan. δ		− .26	+ 1.41	− .32
c sec. δ		+ .65	+ 3.17	+ .64
r				
T		11 58 21.91	12 5 52.84	
a		11 58 30.46	12 5 61.74	12 13 10.64
Δ T		8.55	8.63	8.64

?

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		April 28			April 28			April 28	
Observer		E.P.A.			E.P.A.			E.P.A.	
Illumin'n		W.			W.			W.	
Star		β Corvi			21 Cassiopeae			δ Virginis	
Mag.									
δ		June 22° 29′ S.			Ciram. 74° 16′			4° 59′ S.	
Wire	a								
"	b								
"	c								
"	1	12	27	12.6	12	36	26.0	13	2 52.6
"	2			16.2			39.1		56.0
"	3			20.3			52.4		59.9
"	4			24.2		37	6.7		3 3.4
"	5			28.1			19.3		7.0
"	d								
"	e								
"	f								
Sum				101.4			263.5		298.9
Mean		12	27	20.28	12	36	52.70	13	2 59.78
Red'n to									
m				+ 20			+ 20		
n. tan. δ				− 48			− 1.59		
c. sec. δ				+ 69			− 2.31		
r									
T		12	27	20.69	12	36	48.95		
a		12	27	29.19	12	36	57.10	13	3 8.72
Δ T				8.50			8.15		

Δ T at 11h 4m (Clock Fast) = 8s.46

Rate since 26h = + .04

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		April 28				April 28				April 30					
Observer		E. P. A.				E. P. A.				E. P. A.					
Illumin'n		W.				W.				W.					
Star		Polaris				α Virginis				τ Leonis					
Mag.															
δ		88°	36′	13″		10°	28′			3°	35′				
Wire	a														
"	b														
"	c														
"	1	13	5	45.0		13	18	0.0		11	20	53.8			
"	2		8	18.6				3.7				57.5			
"	3		10	37.0				7.4			21	1.1			
"	4		13	12.2				11.1				4.8			
"	5		15	31.9				14.8				8.4			
"	d														
"	e														
"	f														
				2047											
Sum				206.7				37.0				5.6			
Mean		13	10	41.34		13	18	7.40		11	21	1.12			
				40.94											
Red'n to															
m												+.25		+.20	
n . tan. δ												−.49		−.63	
c . sec. δ												+.44		+.45	
r															
T										11	21	1.32		1.14	
a		13	10	11.68		13	18	16.28		11	21	10.13		10.13	
Δ T												8.81		8.99	
														8.86	

c = + .45
n = − .59

Case put on clock
April 29

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		April 30	April 30	April 30
Observer		E.P.A.	E.P.A.	E.P.A.
Illumin'n		W.	W.	W.
Star		91 Leonis	γ Cephei	γ Ursae Majoris
Mag.				
δ		0° 6′ N.	76° 54′	54° 26′
				Circum.
Wire	a			
"	b			
"	c			
"	1	11 29 56.5	11 33 19.9	11 46 31.5
"	2	30 0.1	36.0	37.6
"	3	3.8	51.4	43.7
"	4	7.2	34 9.0	49.9
"	5	11.0	23.3	56.1
"	d			
"	e			
"	f			
Sum		18.6	259.6	218.8
Mean		11 30 3.72	11 33 51.92	11 46 43.76
Red'n to				
m		+.25 +.20	+.25 +.20	+.25 +.20
n.tan.δ		−.53 −.68	−3.01 −3.87	+.28 +.36
c.sec.δ		+.44 +.45	−1.92 +1.98	+.75 +.77
r				
T		11 30 3.88 3.69	11 33 47.24 47.32	11 46 45.04 44.09
a		11 30 12.72	33 55.94	11 46 53.76
Δ T		8.84 9.03	8.70 8.87	8.72 9.67 8.74

Equat circuit adjusted and Coelput in Clock on the 29th

1867phae.proj..336A

Date		May 1			May 1			May 1			
Observer		E.P.A.			E.P.A.			E.P.A.			
Illumin'n		W.			W.			W.			
Star		γ' Leonis			ρ Leonis			l Leonis			
Mag.											
δ		20° 30'			9° 59'			11° 14'			
Wire	a										
"	b										
"	c										
"	1	10	12	25.8	10	25	36.0	10	42	3.5	
"	2			29.6			39.7			7.2	
"	3			33.5			43.6			11.0	
"	4			37.1			47.0			14.8	
"	5			41.0			50.9			18.4	
"	d										
"	e										
"	f										
Sum				167.0			217.2			54.9	
Mean		10	12	33.40	10	25	43.64	10	42	10.95	
Red'n to											
m		+.30		+.35	+.30		+.35	+.30		35	
n. tan. δ		−.24		+.15	−.33		21	−.32		20	
c. sec. δ		+.47		−.48	+.44		.46	+.44		46	
r											
T		10	12	33.93	33.57	10	25	44.05	10	42	11.37
a		10	12	42.24	10	25	52.46	10	42	19.92	
Δ T				8.31	8.16		8.41	8.22		8.55	8.46

c = + 45
n = − 56 (= .286)
m =

ΔT = May 1 = 8.36

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 1	May 1	May 1
Observer		E.P.A.	E.P.A.	E.P.A.
Illumin'n		W.		W.
Star		ι Cephei	α Ursae Majoris	8 Leonis
Mag.				
δ		65° 30′	62° 28′	21° 15′
Wire	a			
"	b			
"	c			
"	1	10 44 35.6	10 55 8.5	11 6 49.4
"	2	44.3	16.6	53.1
"	3	52.6	24.6	57.0
"	4	45 1.8	32.1	7 0.8
"	5	8.7	40.0	4.8
"	d			
"	e			
"	f			
Sum		263.0	121.8	285.1
Mean		10 44 52.60	10 55 24.36	11 6 57.02
Red'n to				
m		+.30 35	+.30 35	+.30 35
n . tan. δ		−1.40 89	+.45 32	−.23 15
c . sec. δ		−1.05 108	+.94 97	+.47 48
r				
T		10 44 50.45	10 55 26.05	11 6 57.56
		59.18		
a		22 44 59.20	10 55 34.44	11 7 6.16
Δ T.		8.75 ~~8.22~~	8.41 8.44	8.60 8.46

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date	May 1	May 1	May 1
Observer	E. P. A.	E. P. A.	E. P. A
Illumin'n	W.	W.	
Star	o Cephei	τ Leonis	91 Leonis
Mag.			
δ	67° 23′	3° 35′	0° 6′ S.
Wire a			
" b			
" c			
" 1	11 12 47.9	11 20 53.9	11 29 56.5
" 2	57.4	57.4	30 01
" 3	13 6.5	21 1.3	4.0
" 4	16.1	4.9	7.5
" 5	25.6	8.5	11.0
" d			
" e			
" f			
Sum	33.5	6.0	19.1
Mean	11 13 6.70	11 21 1.20	11 30 3.82
Red'n to			
m	+.30 .35	+.30 35	+.30 35
n. tan. δ	−1.49 .95	−.38 24	−.41 26
c. sec. δ	−1.13 1.17	+.43 45	+.43 45
r			
T	11 13 4.38	11 21 1.55	11 30 4.14
a	23 13 12.75	11 21 10.12	11 30 12.71
Δ.T	8.37 7.82	8.57 8.36	8.57 8.35

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 1	May 1	May 1
Observer		E.P.A.	E.P.A.	E.P.A.
Illumin'n		W.	W.	W.
Star		β Leonis	γ Ursae Maj.	4 Draconis H
Mag.				
δ		15° 19′	54° 26′	78° 21′
Wire	a			
"	b			
"	c			
"	1	11 41 4.1	11 46 31.3	12 5 12.3
"	2	8.1	37.6	29.8
"	3	11.8	43.9	48.5
"	4	15.5	50.0	6 5.5
"	5	19.3	56.6	24.1
"	d			
"	e			
"	f			
Sum		58.8	219.4	240.2
Mean		11 41 11.76	11 46 43.88	12 5 48.04
Red'n to				
m		+.30 35	+.30 35	+.30 35
n . tan. δ		−.29 18	+.22 14	+1.78 1.13
c . sec. δ		+.45 47	+.75 77	+2.16 2.23
r				
T		11 41 12.22	11 46 45.15	12 5 52.28
a		11 42 20.67	11 46 53.74	12 5 61.55
Δ T		8.47 8.29	8.59 8.60	9.27

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 1			May 1			May 3				
Observer		E.P.A.			E.P.A.			E.P.A.				
Illumin'n		W.			W.			W.				
Star		η Virginis			β Corvi			γ' Leonis				
Mag.												
δ		0° 4′			22° 40′ S.			20° 30′				
Wire	a											
"	b											
"	c											
"	1	12	12	54.6	12	27	12.4	10	12	26.0		
"	2			58.0			16.6			29.8		
"	3		13	1.8			20.4			33.7		
"	4			5.5			24.2			37.5		
"	5			9.0			28.1			41.6		
"	d											
"	e											
"	f											
Sum				8.9			101.7			168.6		
Mean		12	13	1.78	12	27	20.34	10	12	33.72		
Red'n to												
m		+.30		35	+.30		35	+.40	+	32		
n. tan. δ		−.41		26	−.60		38	−.32				
c. sec. δ		+.43		45	+.47		49	+.47				
r												
T		12 13 2.10			12 27 20.51			10 12 34.27				
a		12	13	10.62	12	27	29.17	10	12	42.20		
										8.48		
Δ T			8.52	8.30		8.66	8.39		7.93			

$c = +45$
$n = -61$
$\bar{m} =$

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 3	May 3	May 3
Observer		E.P.A.	E.P.A.	E.P.A.
Illumin'n		W.	W.	W.
Star		ρ Leonis	l Leonis	ε Cephei
Mag.				
δ		9° 09′	11° 14′	65° 30′
Wire	a			
"	b			
"	c			
"	1	10 25 36.4	10 42 3.6	10 44 35.7
"	2	40.0	7.2	44.5
"	3	43.8	11.0	53.5
"	4	47.4	14.7	45 2.9
"	5	51.0	18.2	11.1
"	d			
"	e			
"	f			
Sum		218.6	54.7	267.7
Mean		10 25 43.72	10 42 10.94	10 44 53.54
Red'n to				
m		+.40	+.40	+.40
n.tan. δ		−.44	−.43	−1.87
c.sec. δ		+.44	+.44	−1.05
r				
T		10 25 44.12	10 42 11.35	10 44 51.12
a		10 25 52.43	10 42 19.89	22 44 59.28
		8.71	8.95	
Δ T		8.31	8.54	8.16

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 3	May 3	May 3
Observer		E.P.A.	E.P.A.	E.P.A.
Illumin'n		W.	W.	W.
Star		α Ursae Majoris	8 Leonis	8 Crateris
Mag.				
δ		62° 28′	21° 15′	14° 4′
Wire	a			
"	b			
"	c			
"	1	10 55 8.7	11 6 49.3	11 12 29.8
"	2	16.4	53.4	33.5
"	3	24.4	57.1	37.1
"	4	31.9	1.0	41.1
"	5	40.0	5.0	44.7
"	d			
"	e			
"	f			
Sum		121.4	285.8	186.2
Mean		10 55 24.28	11 6 57.16	11 12 37.24
Red'n to				
m		+.40	+.40	+.40
n. tan. δ		+.61	−.31	−.70
c. sec. δ		+.84	+.47	+.45
r				
T		10 55 26.13	11 6 57.72	11 12 37.39
a		10 55 34.37	11 7 6.13	11 12 45.88
		10.89	8.97	8.64
Δ T		8.24	8.41	8.49

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 3	May 3	May 3
Observer		E.P.A.	E.P.A.	E.P.A.
Illumin'n		W.	W.	W.
Star		τ Leonis	91 Leonis	γ Cephei
Mag.				
δ		3° 35′	0° 5′ S.	76° 54′
Wire	a			
"	b			
"	c			
"	1	11 20 53.9	11 29 56.6	11 33 20.7
"	2	57.6	30 0.3	36.6
"	3	21 1.2	3.8	51.9
"	4	4.8	7.3	34 8.7
"	5	8.7	11.0	24.3
"	d			
"	e			
"	f			
Sum		6.2	19.0	262.2
Mean		11 21 1.24	11 30 3.80	11 33 52.44
Red'n to				
m		+ .40	+ .40	+ .40
n . tan. δ		− .51	− .55	− 3.12
c . sec. δ		+ .43	+ .43	− 1.92
τ				
T		11 21 1.56	11 30 4.08	11 33 47.80
a		11 21 10.10	11 30 12.69	23 33 56.22
				3.78
Δ T		8.54	8.61	8.42

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 3	May 3	May 3
Observer		E.P.A.	E.P.A.	E.P.A.
Illumin'n		W	W.	W.
Star		β Leonis	γ Ursæ Majoris	ο Virginis
Mag.				
δ		15° 19′	54° 26′	9° 28′
Wire	a			
"	b			
"	c			
"	1	11 42 41.1	11 46 31.5	11 58 14.3
"	2	8.1	37.9	18.0
"	3	11.9	44.3	21.6
"	4	15.6	50.6	25.1
"	5	19.2	56.9	28.9
"	d			
"	e			
"	f			
Sum		58.9	221.2	107.9
Mean		11 42 11.78	11 46 44.24	11 58 21.58
Red'n to				
m		+ .40	+ .40	+ .40
n . tan. δ		− .38	+ .29	− .44
c . sec. δ		+ .45	+ .75	+ .44
r				
T		11 42 12.25	11 46 45.68	11 58 21.98
a		11 42 20.67	11 46 53.70	11 58 30.43
Δ T		8.42	8.02	8.45

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 3			May 3			May 3		
Observer		E. P. A.			E. P. A.			E. P. A.		
Illumin'n		W			W			W.		
Star		4 Draconis H			η Virginis			β Corvi		
Mag.										
δ		78° 21′			0° 4′			22° 40′ S.		
Wire	a									
"	b									
"	c									
"	1	12	5	11.8	12	12	54.7	12	27	12.8
"	2			30.8			58.4			16.7
"	3			48.8		13	1.8			20.8
"	4		6	6.0			5.4			24.7
"	5			24.2			9.1			28.7
"	d									
"	e									
"	f									
Sum				241.6			9.4			103.7
Mean		12	5	48.32	12	13	1.88	12	27	20.74
Red'n to										
m				+ .40			+ .40			+ .40
n . tan. δ				+ 2.37			− .54			− .80
c . sec. δ				+ 2.16			+ .43			+ .47
r										
T		12	5	53.25	12	13	2.17	12	27	20.81
a		12	5	61.80	12	13	10.61	12	27	29.17
Δ T				8.55			8.44			8.36

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 3	May 8	May 8
Observer		E. P. A.	E. P. A.	E. P. A.
Illumin'n		W.	E.	E.
Star		21 Cassiopeae	τ Leonis	λ Draconis
Mag.				
δ		74° 16′	3° 35′	70° 4′
Wire	a			
"	b			
"	c			
"	1	12 36 26.4	11 20 56.7	11 23 6.7
"	2	39.5	21 0.2	17.3
"	3	52.7	3.9	27.4
"	4	37 6.3	7.7	38.5
"	5	19.6	11.2	49.0
"	d			
"	e			
"	f			
Sum		264.5	19.7	138.9
Mean		12 36 52.90	11 21 3.94	11 23 27.78
Red'n to				
m		+ .40	+ .35	+ .35
n . tan. δ		− 2.68	+ .04	− .09
c . sec. δ		− 1.61	− .49	− 1.45
r				
T		49.01	11 21 3.84	11 23 26.59
a		0 36 57.32	11 21 10.94	11 23 33.08
Δ T		8.31	6.20	6.49

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 8	May 8	May 8
Observer		E. P. A.	E. P. A.	E. P. A.
Illumin'n		E.	E.	E.
Star		91 Leonis	γ Cephei	β Leonis
Mag.				
δ		0° 6′ S.	76° 54′	15° 19′
Wire	a			
"	b			
"	c			
"	1	11 29 59.6	11 33 15.2	11 42 7.0
"	2	30 3.1	31.0	10.7
"	3	6.4	47.7	14.3
"	4	10.1	34 3.0	18.0
"	5	13.8	19.1	21.8
"	d			
"	e			
"	f			
Sum		33.0	236.0	71.8
Mean		11 30 6.60	11 33 47.20	11 42 14.36
Red'n to				
m		+ .35	+ .35	+ .35
n. tan. δ		+ .05	+ .26	+ .03
c. sec. δ		− .49	+ 2.18	− .49
r				
T		11 30 6.51	11 33 49.99	11 42 14.25
a		11 30 12.65	28 33 56.61	11 42 20.62
Δ T		6.14	6.62	6.37

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 8	May 8	May 8
Observer		E.P.A.	E.P.A.	E.P.A.
Illumin'n		E.	E.	E.
Star		21 Cassiopeae	32 Camelop.-foll.	Polaris
Mag.				
δ		74° 16′	84° 8′	88° 36′ 10″.0
Wire	a			
"	b			
"	c			
"	1	12 36 21.4	12 47 3.7	13 4 47.2
"	2	35.0	38.3	7 20.3
"	3	49.0	48 12.6	9 46.8
"	4	37 1.4	49.5	12 15.9
"	5	15.0	49 25.6	14 42.0
"	d			
"	e			
"	f			
Sum		241.8	69.7	232.2
Mean		12 36 48.36	12 48 13.94	13 9 46.44
Red'n to				
m		+ .35	+ .35	+ .35
n . tan. δ		+ .22	− .44	+ 2.09
c . sec. δ		+ 1.83	− 4.84	+ 20.26
r				
T		12 36 50.76	12 48 9.07	13 10 9.14
a		0 36 57.65	12 48 16.16	1 10 16.17
Δ T		6.89	7.14	7.03

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 8	May 8	May 8
Observer		E. P. A.	E. P. A.	E. P. A.
Illumin'n		Eo.	Eo.	Eo.
Star		α Virginis	A Cassiopeae	η Ursae Majoris
Mag.				
δ		10° 28' S.	69° 35'	49° 58'
Wire	a			
"	b			
"	c			
"	1	13 18 2.8	13 20 56.4	13 42 4.7
"	2	6.3	21 6.9	10.6
"	3	10.0	17.6	15.8
"	4	13.7	28.0	21.8
"	5	17.5	38.3	27.0
"	d			
"	e			
"	f			
Sum		50.3	87.2	79.9
Mean		13 18 10.06	13 21 17.44	13 42 15.98
Red'n to				
m		+ .35	+ .35	+ .35
n . tan. δ		+ .05	+ .18	− .01
c . sec. δ		− .50	+ 1.42	− .77
r				
T		13 18 9.96	13 21 19.39	13 42 15.55
a		13 18 16.27	1 21 25.80	13 42 21.88
Δ T		6.31	6.41	6.33

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

		May 8	May 9	May 9
Date				
Observer		E. P. A.	E. P. A.	E. P. A.
Illumin'n		E.	E.	E
Star		η Bootis	ι Cephei	α Ursae Majoris
Mag.				
δ		19° 4′	65° 30′	62° 28′
Wire	a			
"	b			
"	c			
"	1	13 48 11.8	10 44 34.1	10 55 13.0
"	2	15.5	42.7	20.8
"	3	19.1	51.7	28.6
"	4	23.2	45 0.2	36.4
"	5	27.0	9.1	44.3
"	d			
"	e			
"	f			
Sum		96.6	257.8	143.1
Mean		13 48 19.32	10 44 51.56	10 55 28.62
Red'n to m		+ .35	+ .35	+ .35
n . tan. δ		+ .03	+ .03	− .01
c . sec. δ		− .52	+ 1.22	− 1.09
r				
T		13 48 19.18	10 44 53.16	10 55 27.87
a		13 48 25.58	22 44 59.61	10 55 34.17
Δ T		6.40	6.45	6.30

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 9			May 9			May 9			
Observer		E. P. A.			E. P. A.			E. P. A.			
Illumin'n		E.			E.			E.			
Star		8 Leonis			o Cephei			τ Leonis			
Mag.											
δ		21° 15′			67° 23′			3° 35′			
Wire	a										
"	b										
"	c										
"	1	11	6	52.2	11	12	45.5	11	20	56.7	
"	2			56.1			55.4		21	0.4	
"	3		7	0.0		13	5.0			4.0	
"	4			3.9			13.8			7.8	
"	5			7.8			23.6			11.3	
"	d										
"	e										
"	f										
Sum				00.0			23.3			20.2	
Mean		11	7	0.00	11	13	4.66	11	21	4.04	
Red'n to											
m				+.35			+.35			+.35	
n. tan. δ				+.01			+.03			+.04	
c. sec. δ				−.54			+1.31			−.50	
r											
T		11	6	59.82	11	13	6.35	11	21	3.93	
a		11	7	6.06	23	13	13.17	11	21	10.03	
Δ T				6.24			6.82			6.13	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

		May 9	May 9	May 9
Date				
Observer		E. P. A.	E. P. A.	E. P. A.
Illumin'n		E.	E.	E.
Star		λ Draconis	91 Leonis	γ Cephei
Mag.				
δ		70° 4′	0° 6′ S.	76° 54′
Wire	a			
"	b			
"	c			
"	1	11 23 6.6	11 29 39.4	11 33 15.2
"	2	17.5	30 3.0	31.7
"	3	27.2	6.5	48.0
"	4	38.8	10.2	34 3.1
"	5	48.9	13.8	19.5
"	d			
"	e			
"	f			
Sum		139.0	32.9	237.5
Mean		11 23 27.80	11 30 6.58	11 33 47.50
Red'n to				
m		+ .35	+ .35	+ .35
n . tan. δ		− .02	+ .01	+ .05
c . sec. δ		− 1.47	− .50	+ 2.23
r				
T		11 23 26.66	11 30 6.44	11 33 50.13
a		11 23 33.48	11 30 12.64	23 33 56.70
Δ T		6.82	6.20	6.57

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

		May 9	May 9	May 9
Date				
Observer		E. P. A.	E. P. A.	E. P. A.
Illumin'n		E.	E.	E.
Star		β Leonis	γ Ursae Maj.	Gr. 4163
Mag.				
δ		15° 19′	54° 26′	73° 40′
Wire	a			
"	b			
"	c			
"	1	11 42 7.1	11 46 35.6	
"	2	10.9	41.6	11 48 4.0
"	3	14.5	47.7	17.4
"	4	18.4	54.3	29.4
"	5	22.0	47 0.4	42.0
"	d			
"	e			
"	f			
Sum		72.9	239.6	
Mean		11 42 14.38	11 46 47.92	
Red'n to				
m̄		+ .35	+ .35	
n . tan. δ		+ .01	− .00	
c . sec. δ		− .53	− .87	
r				
T		11 42 14.41	11 46 47.40	
a		11 42 20.61	11 46 53.57	23 48 26.03
Δ T		6.20	6.17	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

		May 9	May 9	May 9
Date				
Observer		E.P.A.	E.P.A.	E.P.A.
Illumin'n		E.	E.	E.
Star		β Corvi	21 Cassiopeae	32 Camelop. (Joll.)
Mag.				
δ		22° 40' S	74° 16'	84° 8'
Wire	a			
"	b			
"	c			
"	1	12 27 15.7	12 36 22.4	12 47 3.6
"	2	19.3	35.4	38.9
"	3	23.2	48.8	48 13.6
"	4	27.3	37 1.9	49.8
"	5	31.2	15.4	49 27.1
"	d			
"	e			
"	f			
Sum		116.7	243.9	73.0
Mean		12 27 23.34	12 36 48.78	12 48 14.60
Red'n to				
m		+ .35	+ .35	+ .35
n . tan. δ		+ .01	+ .04	− .09
c . sec. δ		− .55	+ 1.86	− 4.94
τ				
T		12 27 23.15	12 36 51.03	12 48 9.92
a		12 27 29.13	0 36 57.43	12 48 16.01
Δ T		5.98	6.40	6.09

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 9			May 9				May 9					
Observer		E.P.A.			E.P.A.				E.P.A.					
Illumin'n		E.			E.				E.					
Star		Polaris			α Virginis				ζ Virginis					
Mag.														
δ		88° 36' 9".8			10° 28' S.				0° 5'					
Wire	a													
"	b													
"	c													
"	1	13	4	48.3	13	18	2.8		13	27	46.5			
"	2		7	16.0			6.6				50.1			
"	3						10.0				53.6			
"	4		12	10.6			13.8				57.4			
"	5						17.6			28	1.0			
"	d													
"	e													
"	f													
Sum							50.8				268.6			
Mean					13	18	10.16		13	27	53.72			
Red'n to														
m							+ .35				+ .35			
n . tan. δ							+ .01				+ .01			
c . sec. δ							− .52				− .50			
τ														
T					13	18	10.00		13	27	53.56			
a		1	10	16.76	13	18	16.27		13	27	59.76			
Δ T							6.27				6.20			

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 11	May 11	May 11
Observer		E. P. A	E. P. A.	E. P. A.
Illumin'n		E.	E.	E.
Star		S Leonis	S Crateris	τ Leonis
Mag.				
δ		21° 15′	14° 4′ S.	3° 35′
Wire	a			
"	b			
"	c			
"	1	11 6 52.4	11 12 32.5	11 20 57.0
"	2	56.0	36.2	21 0.5
"	3	7 0.0	39.9	4.0
"	4	3.7	43.7	7.6
"	5	7.8	47.6	11.7
"	d			
"	e			
"	f			
Sum		299.9	199.9	20.8
Mean		11 6 59.98	11 12 39.98	11 21 4.16
Red'n to				
m		+ .35	+ .35	+ .35
n. tan. δ		+ .03	+ .06	+ .04
c. sec. δ		− .55	− .53	− .51
r				
T		11 6 59.81	11 12 39.86	11 21 4.04
a		11 7 6.04	11 12 45.79	11 21 10.01
Δ T		6.23	5.93	5.97

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 11.			May 11			May 11			
Observer		E. P. A.			E. P. A.			E. P. A.			
Illumin'n		E.			E.			E.			
Star		λ Draconis			91 Leonis			β Leonis			
Mag.											
δ		70° 4′			0° 6′ S.			15° 19′			
Wire	a										
"	b										
"	c										
"	1	11	23	6.8	11	29	59.2				
"	2			17.8		30	3.0				
"	3			27.8			6.6	11	42	14.6	
"	4			38.6			10.2			18.3	
"	5			49.5			13.8			22.0	
"	d										
"	e										
"	f										
Sum				140.5			32.8				
Mean		11	23	28.10	11	30	6.56				
Red'n to											
m				+ .35			+ .35				
n . tan. δ				− 109			+ .05				
c . sec. δ				− 1.51			− .51				
r											
T		11	23	26.85	11	30	6.45				
a		11	23	32.94	11	30	12.62	11	42	20.59	
Δ T				6.09			6.17				

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

		May 11	May 11	May 11
Date				
Observer		E. P. A.	E. P. A.	E. P. A.
Illumin'n		E.	E.	E.
Star		γ Ursae Majoris	β Corvi	21 Cassiopeae
Mag.				
δ		57° 26′	22° 40′ S.	74° 16′
Wire	a			
"	b			
"	c			
"	1	11 46 35.6	12 27 15.5	12 36 22.3
"	2	41.7	19.3	35.0
"	3	47.7	23.2	48.6
"	4	54.0	27.0	37 1.7
"	5	47 0.2	31.1	15.5
"	d			
"	e			
"	f			
Sum		239.2	116.1	243.1
Mean		11 46 47.84	12 27 23.22	12 36 48.62
Red'n to				
m		+ .35	+ .35	+ .35
n . tan. δ		− .02	+ .07	+ .22
c . sec. δ		− .89	− .56	+1.90
r				
T		11 46 47.28	12 27 23.08	51.09
a		11 46 53.53	12 27 29.11	0 36 57.65
Δ T		6.25	6.03	6.56

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 11			May 11			May 11		
Observer		E.P.A.			E.P.A.			E.P.A.		
Illumin'n		E.			E.			E.		
Star		12 Can. Ven.			δ Virginis			Polaris		
Mag.										
δ		39° 2′			4° 50′ S.			88° 36′ 9″.4		
Wire	a									
"	b									
"	c									
"	1	12	49	37.0	13	2	55.5	13	4	46.0
"	2			41.8			59.0		7	14.8
"	3			46.0		3	2.6		9	51.9
"	4			50.9			6.5		12	16.2
"	5			55.7			9.7		14	43.1
"	d									
"	e									
"	f									
Sum				231.4			13.3			232.0
Mean		12	49	46.28	13	3	2.66	13	9	46.40
Red'n to										
m				+.35			+.35			+.35
n. tan. δ				+.00			+.05			+2.09
c. sec. δ				−.66			−.51			+21.08
τ										
T		12	49	45.97	13	3	2.50	13	10	9.92
a		12	49	52.28	13	3	8.69	1	10	17.85
Δ T				6.31			6.14			7.93

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 11			May 11			May 11			
Observer		E.P.A.			E.P.A.			E.P.A.			
Illumin'n		E.			E.			E.			
Star		χ Virginis			A Cassiopeae			ζ Virginis			
Mag.											
δ		10°	28′	S.	69°	35′		0°	5′		
Wire	a										
"	b										
"	c										
"	1	13	18	2.9	13	20	56.0	13	27	46.5	
"	2			6.5		21	6.8			50.1	
"	3			9.8			17.3			53.7	
"	4			13.8			27.1			57.4	
"	5			17.5			37.9		28	1.0	
"	d										
"	e										
"	f										
Sum				48.5			85.1			268.7	
Mean		13	18	9.70	13	21	17.02	13	27	53.74	
Red'n to											
m				+.35			+.35			+.35	
n.tan.δ				+.05			+.18			+.05	
c.sec.δ				−.53			+1.49			−.53	
r											
T		13	18	9.57	13	21	19.04	13	27	53.61	
a		13	18	16.27	1	21	25.94	13	27	59.76	
Δ T				6.70			6.90			6.15	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 12	May 12	May 12
Observer		E.P.A.	E.P.A.	E.P.A.
Illumin'n		E.	E.	E.
Star		β Leonis	γ Ursae Majoris	o Virginis
Mag.				
δ		15° 19′	54° 26′	9° 28′
Wire	a			
"	b			
"	c			
"	1	11 42 7.0	11 46 35.5	11 58 17.0
"	2	10.8	41.6	20.6
"	3	14.5	47.7	24.1
"	4	18.2	54.0	28.0
"	5	22.0	47 0.1	31.6
"	d			
"	e			
"	f			
Sum		72.5	238.9	121.3
Mean		11 42 14.50	11 46 47.78	11 58 24.26
Red'n to				
m		+.35	+.35	+.35
n.tan.δ		+.02	−.01	+.02
c.sec.δ		−.55	−.90	−.52
r				
T		11 42 14.32	11 46 47.22	11 58 24.11
a		11 42 20.58	11 46 53.51	11 58 30.34
Δ T		6.26	6.29	6.23

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 12	May 12	May 12
Observer		E. P. A.	E. P. A.	E. P. A.
Illumin'n		E.	E.	E.
Star		η Virginis	κ Draconis	21 Cassiopeae
Mag.				
δ		0° 4′	70° 31′	74° 16′
Wire	a			
"	b			
"	c			
"	1	12 12 57.2	12 27 25.0	12 36 23.0
"	2	13 1.0	36.0	35.7
"	3	4.4	46.5	49.5
"	4	8.1	57.6	37 2.0
"	5	11.8	28 8.3	15.5
"	d			
"	e			
"	f			
Sum		22,5	233.4	245.7
Mean		12 13 4.50	12 27 46.68	12 36 49.14
Red'n to				
m		+.35	+.35	+.35
n . tan. δ		+.03	−.06	+.13
c . sec. δ		−.52	−1.57	+1.94
r				
T		12 13 4.36	12 27 45.40	51.56
a		12 13 10.56	12 27 51.64	0 36 57.90
Δ T		6.20	6.24	6.34

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 12			May 12			May 12		
Observer		E. P. A.			E. P. A.			E. P. A.		
Illumin'n		E.			E.			E.		
Star		32 Camelop. (foll.)			δ Virginis			Polaris		
Mag.										
δ		84° 8′			4° 50′ S.			88° 36′ 9.″2		
Wire	a									
"	b									
"	c									
"	1	12	47	3.7	13	2	55.4	13	4	52.2
"	2			38.9			59.1		7	18.0
"	3		48	13.6		3	2.6		9	56.4
"	4			49.2			6.2		12	14.9
"	5		49	25.1			9.9		14	42.2
"	d									
"	e									
"	f									
Sum				70.5			13.2			243.7
Mean		12	48	14.10	13	3	2.64	13	9	48.74
Red'n to										
m				+.35			+.35			+.35
n. tan. δ				−.26			+.03			+1.25
c. sec. δ				−5.13			−.52			+21.49
τ										
T		12	48	9.06	13	3	2.50	13	10	11.83
a		12	48	15.61	13	3	8.68	1	10	18.35
Δ T				6.55			6.18			6.52

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 12			May 12			May 12			
Observer		E. P. A.			E. P. A.			E. P. A.			
Illumin'n		E.			E.						
Star		α Virginis			ζ Virginis			η Ursae Majoris			
Mag.											
δ		10° 28′ S.			0° 5′			49° 58′			
Wire	a										
"	b										
"	c										
"	1	13	18	2.8	13	27	46.5	13	42	4.7	
"	2			6.3			50.0			10.3	
"	3			10.0			53.6			15.8	
"	4			13.9			57.3			21.6	
"	5			17.5		28	0.9			27.1	
"	d										
"	e										
"	f										
Sum				50.5			268.3			79.5	
Mean		13	18	10.10	13	27	53.66	13	42	15.90	
Red'n to											
m				+.35			+.35			+.35	
n . tan. δ				+.03			+.03			−.01	
c . sec. δ				−.54			−.52			−.82	
r											
T		13	18	9.94	13	27	53.52	13	42	15.42	
a		13	18	16.27	13	27	59.76	13	42	21.84	
Δ T				6.33			6.24			6.42	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

		May 12	May 12	May 14
Date				
Observer		E. P. A.	E. P. A.	E. P. A.
Illumin'n		E.	E.	E.
Star		η Bootis	50 Cassiopeae	8 Leonis
Mag.				
δ		19° 4′	71° 47′	21° 15′
Wire	a			
"	b			
"	c			
"	1	13 48 11.7	13 51 39.7	11 6 52.2
"	2	15.6	51.4	56.0
"	3	19.2	52 3.1	59.8
"	4	23.2	15.0	7 3.8
"	5	27.0	26.0	7.7
"	d			
"	e			
"	f			
Sum		96.7	15.2	299.5
Mean		13 48 19.34	13 52 3.04	11 6 59.90
Red'n to				
m		+.35	+.35	+.35
n. tan. δ		+.02	+.12	+.03
c. sec. δ		−.56	+1.68	−.57
r				
T		13 48 19.15	13 52 5.19	11 6 59.71
a		13 48 25.58	1 52 11.58	11 7 6.00
Δ T		6.43	6.39	5.29

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

		May 14	May 14	May 14
Date				
Observer		E. P. A.	E. P. A.	E. P. A.
Illumin'n		E.	E.	E.
Star		δ Crateris	τ Leonis	λ Draconis
Mag.				
δ		14° 4′ S.	3° 35′	70° 4′
Wire	a			
"	b			
"	c			
"	1	11 12 32.3	11 20 56.9	11 23 6.7
"	2	36.0	21 0.5	17.5
"	3	39.7	4.0	27.6
"	4	43.5	7.8	38.7
"	5	47.4	14.3	49.0
"	d			
"	e			
"	f			
Sum		198.9	20.5	139.5
Mean		11 12 39.78	11 21 4.10	11 23 27.90
Red'n to				
m		+ .35	+ .35	+ .35
n . tan. δ		+ .07	+ .05	− .11
c . sec. δ		− .55	− .53	− 1.57
τ				
T		11 12 39.65	11 21 3.97	11 23 26.57
a		11 12 45.76	11 21 9.98	11 23 32.80
Δ T		6.11	6.01	6.23

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 14			May 14			May 14			
Observer		E.P.A.			E.P.A.			E.P.A.			
Illumin'n		E.			E.			E.			
Star		91 Leonis			β Leonis			γ Ursae Majoris			
Mag.											
δ		0° 6′ S.			15° 19′			54° 26′			
Wire	a										
"	b										
"	c										
"	1	11	29	59.5	11	42	7.1	11	46	35.6	
"	2		30	3.1			10.8			41.1	
"	3			6.6			14.5			47.8	
"	4			10.3			18.2			54.1	
"	5			14.0			22.2		47	0.3	
"	d										
"	e										
"	f										
Sum				33.5			72.8			239.5	
Mean		11	30	6.70	11	42	14.56	11	46	47.90	
Red'n to											
m				+.35			+.35			+.35	
n.tan.δ				+.05			+.04			−.03	
c.sec.δ				−.53			−.56			−.92	
τ											
T		11	30	6.57	11	42	14.39	11	46	47.30	
a		11	30	12.59	11	42	20.56	11	46	53.46	
Δ T				6.02			6.17			6.16	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 14	May 14	May 14
Observer		E. P. A.	E. P. A.	E. P. A.
Illumin'n		E.	E.	E.
Star		Groombridge 4163	o Virginis	4 Draconis H.
Mag.				
δ		73° 40′	9° 28′	78° 21′
Wire	a			
"	b			
"	c			
"	1	11 47 51.4	11 58 17.0	12 5 21.6
"	2	48 4.7	20.7	39.5
"	3	17.6	24.5	56.2
"	4	30.6	27.9	6 14.1
"	5	43.8	31.7	33.0
"	d			
"	e			
"	f			
Sum		88.1	121.8	284.4
Mean		11 48 17.62	11 58 24.36	12 5 56.88
Red'n to				
m		+ .35	+ .35	+ .35
n . tan. δ		+ .26	+ .04	− .24
c . sec. δ		+ 1.91	− .54	− 2.65
r				
T		11 48 20.14	11 58 24.21	12 6 54.34
a		23 48 26.39	11 58 30.32	12 6 0.61
Δ T		6.25	6.11	6.27

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 14			May 14			May 14		
Observer		E. P. A.			E. P. A.			E. P. A.		
Illumin'n		E.			E.			E.		
Star		γ Virginis			β Corvi			12 Can. Ven.		
Mag.										
δ		0° 4′			22° 40′ S			39° 2′		
Wire	a									
"	b									
"	c									
"	1	12	12	57.5	12	27	15.5	12	49	36.1
"	2		13	1.0			19.7			40.8
"	3			4.6			23.5			45.2
"	4			8.2			27.4			50.1
"	5			11.8			31.3			54.9
"	d									
"	e									
"	f									
Sum				23.1			117.4		232.1	227.1
Mean		12	13	4.62	12	27	23.48	12	49	46.42
Red'n to										
m				+.35			+.35			+.35
n. tan. δ				+.05			+.08			+.01
c. sec. δ				−.53			−.58			−.69
τ										
T		12	13	4.49	12	27	23.33	12	49	46.09
a		12	13	10.54	12	27	29.09	12	49	52.25
Δ T				6.05			5.76			6.16

Add one second to each of these

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 14			May 14			May 14			
Observer		E.P.A.			E.P.A.			E.P.A.			
Illumin'n		E.			E.			E.			
Star		δ Virginis			Polaris			α Virginis			
Mag.											
δ		4°	50′	N.	88°	36′	8.″8	10°	28′	N.	
Wire	a										
"	b										
"	c										
"	1	13	2	55.6	13	4	52.4	13	18	3.0	
"	2			59.2						6.7	
"	3		3	2.7		9	54.4			10.3	
"	4			6.3		12	17.1			14.1	
"	5			10.0		14	46.5			17.7	
"	d										
"	e										
"	f										
Sum				13.8						51.8	
Mean		13	3	2.76				13	18	10.36	
Red'n to											
m				+.35						+.35	
n. tan. δ				+.06						+.07	
c. sec. δ				−.53						−.55	
τ											
T		13	3	2.64				13	18	10.23	
a		13	3	8.67	1	10	19.29	13	18	16.26	
Δ T				6.03						6.03	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

		May 14	May 22	May 22
Date				
Observer		C. R. A.	E. P. A.	E. P. A.
Illumin'n		E.	W.	W.
Star		ζ Virginis	η Bootis	α Draconis
Mag.				
δ		0° 4′	19° 4′	65° 1′
Wire	a			
"	b			
"	c			
"	1	13 27 46.7	13 48 14.6	14 0 30.3
"	2	50.3	18.4	38.7
"	3	53.8	22.1	47.1
"	4	57.6	26.0	55.4
"	5	28 1.1	29.8	1 4.2
"	d			
"	e			
"	f			
Sum		269.5	110.9	236.3
Mean		13 27 53.90	13 48 22.18	14 0 47.26
Red'n to				
m		+.35	+.56 +.35	+.56 .35
n. tan. δ		+.05	−.11 +.08	+.25 .17
c. sec. δ		−.53	−.02 .00	−.04 .04
r			13 48 22.61	47.48
T		13 27 53.77	13 48 22.61	14 0 48.08
a		13 27 59.75	13 48 25.54	14 0 50.94
Δ T		5.98	2.93 2.93	2.91 3.50

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 22	May 22	May 22
Observer		E. P. A.	E. P. A.	E. P. A.
Illumin'n		W.	W.	W.
Star		α Bootis	ι Bootis?	ε Bootis
Mag.				
δ		19° 52′	52° 28′	27° 38′
Wire	a			
"	b			
"	c			
"	1	14 9 29.0	14 20 28.8	14 39 3.5
"	2	32.7	34.7	7.7
"	3	36.8	40.9	11.8
"	4	40.3	46.6	15.8
"	5	44.4	52.4	19.9
"	d			
"	e			
"	f			
Sum		183.2	203.3	58.7
Mean		14 9 36.64	14 20 40.66	14 39 11.74
Red'n to				
m		+.56 + .35		+.56 + .35
n . tan. δ		−.11 + .08		−.08 + .05
c . sec. δ		−.02 .00		−.02 .00
τ		14 9 37.07		12.14
T		14 9 37.07		14 39 12.20
a		14 9 40.05	14 20 43.87	14 39 15.03
Δ T		2.98 2.98		2.83 2.89

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 22	May 22	May 27
Observer		E. P. A.	E. P. A.	E. P. A.
Illumin'n		W.	W.	W.
Star		α^2 Librae	β Ursae Minoris	α Aurigae
Mag.				
δ		15° 30′ S.	74° 42′	45° 51′
Wire	a			
"	b			
"	c			
"	1	14 43 26.5	14 50 39.1	5 6 44.0
"	2	30.2	52.6	49.5
"	3	34.0	51 7.3	54.6
"	4	37.7	26.5	59.7
"	5	41.6	34.0	7 4.9
"	d			
"	e			
"	f			
Sum		170.0	33.5	272.7
Mean		14 43 34.00	14 51 6.70	5 6 54.54
Red'n to				
m		+.56 .35	+.56 .35	+.56
n. tan. δ		+.24 .16	+.55 .38	+.03
c. sec. δ		−.02 .00	−.06 .00	−.01
τ		14 43 34.59	14 51 7.48	
T		14 43 34.30	14 51 7.75	5 6 55.12
a		14 43 36.85	14 51 10.31	5 6 55.65
Δ T		2.55 2.36	2.56 2.88	0.53

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 28	May 28	May 28
Observer		E. P. A.	E. P. A.	E. P. A.
Illumin'n		W.	W.	W.
Star		4 Draconis H	η Virginis	β Corvi
Mag.				
δ		78° 21′	0° 4′	22° 40′ S.
Wire	a			
"	b			
"	c			
"	1	12 5 22.7	12 13 2.8	12 27 20.7
"	2	40.0	6.2	24.7
"	3	58.4	9.9	28.7
"	4	6 15.5	13.7	32.6
"	5	33.9	17.1	36.5
"	d			
"	e			
"	f			
Sum		288.5	49.7	143.2
Mean		12 5 57.70	12 13 9.94	12 27 28.64
Red'n to				
m		+.56 .56	+.56 .56	+.56 .56
n. tan. δ		+1.07 1.26	±.25 .29	−.36 .42
c. sec. δ		−.02 .00	.00 .00	−.01 .00
r				
T		12 5 59.31	12 13 10.25	12 27 28.83
a		12 5 59.42	12 13 10.41	12 27 28.96
Δ T		0.11 2.42	0.16 .38	0.13 .66

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 28			May 28			May 28			
Observer		E. P. A.			E. P. A.			E. P. A.			
Illumin'n		W.			W.			W.			
Star		21 Cassiopeae			ζ Virginis			η Ursae Majoris			
Mag.											
δ		74°	16′		0°	5′		49°	9′		
Wire	a										
"	b										
"	c										
"	1				13	27	52.0	13	42	9.6	
"	2	12	36	46.5			55.6			15.1	
"	3			59.6			59.2			20.9	
"	4		37	12.8		28	2.7			26.5	
"	5			26.0			6.7			32.0	
"	d										
"	e										
"	f										
Sum							296.2			104.1	
Mean					13	27	59.24	13	42	20.82	
Red'n to											
m					+.56		.56	+.56		.56	
n . tan. δ					−.25		.29	+.08		.09	
c . sec. δ					.00		.06	−.01		.06	
r											
T					13	27	59.55	13	42	21.45	
a		0	36	59.07	13	27	59.69	13	42	21.65	
Δ T							0.14			0.20	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 28	May 28	May 28
Observer		E. P. A.	E. P. A.	E. P. A.
Illumin'n		W.	W.	W
Star		η Bootis	α Draconis	α Bootis
Mag.				
δ		19° 41′	65° 01′	19° 52′
Wire	a			
"	b			
"	c			
"	1	13 48 17.2		14 9 31.7
"	2	21.0		35.5
"	3	24.9	14 0 49.8	39.5
"	4	28.5	58.0	43.3
"	5	32.5	1 6.6	47.0
"	d			
"	e			
"	f			
Sum		124.1		197.0
Mean		13 48 24.82		14 9 39.40
Red'n to m		+.56 .56		+.56 .56
n. tan. δ		−.15 .18		−.15 .17
c. sec. δ		−.01 .00		−.01 .00
r				
T		13 48 25.22		14 9 39.80
a		13 48 25.51	14 0 50.79	14 9 40.02
Δ T		0.29 .01		0.22 .11

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

		May 28	May 28	May 31
Date				
Observer		E. P. A.	E. P. A.	E. P. A.
Illumin'n		W.	W.	W.
Star		5 Ursae Minoris	ε Bootis	21 Cassiopeae
Mag.				
δ		76° 17′	27° 38′	74° 16′
Wire	a			
"	b			
"	c			
"	1	14 27 20.7	14 39 6.0	12 36 34.6
"	2	35.4	10.0	48.6
"	3	51.4	14.4	37 1.1
"	4	28 6.4	18.4	15.1
"	5	22.0	22.5	28.3
"	d			
"	e			
"	f			
Sum		255.9	71.3	7.7
Mean		14 27 51.18	14 39 14.26	12 37 1.54
Red'n to m		+ + .56	+ + .56	+ .56
n. tan. δ		− + 1.86	+ − .11	− 1.34
c. sec. δ		− .02	− .01	+ .02
r				
T		14 27 52.58	14 39 14.70	12 37 0.78
a		14 27 53.14	14 39 15.02	0 36 59.31
Δ T		0.56	+ 0.28	− 1.47

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 31			May 31			May 31		
Observer		E.P.A.			E.P.A.			E.P.A.		
Illumin'n		W.			W.			W.		
Star		12 Can. Ven.			Polaris			α Virginis		
Mag.										
δ		39°	2′		88°	36′	5″6	10°	28′	0″
Wire	a									
"	b									
"	c									
"	1	12	49	43.4				13	18	10.0
"	2			48.0	13	8	14.8			13.6
"	3			53.0		10	36.2			17.4
"	4			57.5		13	11.3			20.8
"	5		50	2.3		15	37.8			24.7
"	d									
"	e									
"	f									
Sum				264.2						86.5
Mean		12	49	52.84				13	18	17.30
Red'n to										
m		+		+.53				+		+.56
n. tan. δ		+		−.03				+		−.33
c. sec. δ				−.01						−.01
r										
T		12	49	53.83				13	18	17.52
a		12	49	52.03	1	10	30.65	13	18	16.17
Δ T				−1.30						−1.35

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 31	May 31	May 31
Observer		E.P.A.	E.P.A.	E.P.A.
Illumin'n		W.	W.	W.
Star		ζ Virginis	η Ursae Majoris	η Bootis
Mag.				
δ		0° 5′	49° 59′	19° 4′
Wire	a			
"	b			
"	c			
"	1	13 27 53.6	13 42 11.0	13 48 18.8
"	2	57.1	16.7	22.7
"	3	28 0.8	22.5	26.5
"	4	4.2	27.7	30.2
"	5	8.0	33.6	34.1
"	d			
"	e			
"	f			
Sum		3.6	111.5	132.3
Mean		13 28 0.72	13 42 22.30	13 48 26.46
Red'n to m		+ +.56	+ +56	+ +.56
n.tan.δ		+ −.27	− +.08	+ −.17
c.sec.δ		.00	−.01	−.01
r				
T		13 28 1.09	13 42 22.93	13 48 26.84
a		13 27 59.67	13 42 21.60	13 48 25.49
Δ T		− 1.34	− 1.33	− 1.33

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		May 31			May 31			May 31			
Observer		E. P. A.			E. P. A.			E. P. A.			
Illumin'n		W			W.			W			
Star		50 Cassiopeae			α Draconis			α Bootis			
Mag.											
δ		71° 47′			64° 61′			19° 52′			
Wire	a										
"	b										
"	c										
"	1	13	51	51.3	14	0	33.8	14	9	33.5	
"	2		52	3.2			42.5			37.2	
"	3			14.0			51.4			41.0	
"	4			26.3			59.7			44.9	
"	5			37.4		1	8.0			48.8	
"	d										
"	e										
"	f										
Sum				72.2			255.4			205.4	
Mean		13	52	14.44	14	0	51.08	14	9	41.08	
Red'n to											
m		+		+.56	+		+.56	+		+.56	
n. tan. δ		+		−1.18	−		+.37	+		−.16	
c. sec. δ				+.02			−.01			−.01	
r											
T		13	52	13.84	14	0	52.00	14	9	41.87	
a		1	52	12.57	14	0	50.71	14	9	40.00	
Δ T				−1.27			−1.29			−1.47	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

		June 3	June 4	June 4
Date				
Observer		A. S.	A. S.	A. S.
Illumin'n		W.	W.	W.
Star		γ Leonis	α Leonis	γ Leonis
Mag.				
δ		20° 30′	12° 37′	20° 30′
Wire	a			
"	b			
"	c			
"	1	10 12 37.0	10 1 16.7	10 12 37.5
"	2	40.7	20.3	41.1
"	3	44.5	24.1	45.3
"	4	48.4	27.9	49.0
"	5	52.3	31.6	53.0
"	d			
"	e			
"	f			
Sum		222.9	120.6	225.9
Mean		10 12 44.58	10 1 24.12	10 12 45.18
Red'n to m		+ +.56	+ +.56	+ +.56
n . tan. δ		+ −.16	+ −.21	+ −.16
c . sec. δ		−.01	−.01	−.01
r				
T		10 12 44.97	10 1 24.46	10 12 45.57
a		10 12 41.80	10 1 20.71	10 12 41.78
Δ T		− 3.17	− 3.75	− 3.79

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

		June 4	June 6	June 8
Date				
Observer		A. S.	A. S.	A. S.
Illumin'n		W.	W.	W.
Star		ρ Leonis	β Geminorum	α Leonis
Mag.				
δ		9° 59′	28° 20′	12° 37′
Wire	a			
"	b			
"	c			
"	1	10 25 48.0	7 37 10.1	10 1 19.3
"	2	51.8	14.0	23.0
"	3	55.4	18.4	26.8
"	4	59.0	22.3	30.3
"	5	26 2.7	26.6	34.2
"	d			
"	e			
"	f			
Sum		276.9	91.4	133.6
Mean		10 25 55.38	7 37 18.28	10 1 26.72
Red'n to				
m		+ +.56	+ +.56	+ +.56
n. tan. δ		+ −.22	+ −.11	+ −.21
c. sec. δ		−.01	−.01	−.01
r				
T		10 25 55.91	7 37 18.72	10 1 27.06
a		10 25 52.03	7 37 13.68	10 1 20.67
Δ T		−3.68	−5.04	−6.39

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

		June 8	June 10	June 10
Date				
Observer		A. S.	A. S.	A. S.
Illumin'n		W.	W.	W.
Star		γ Leonis	α Can. Min.	β Geminorum
Mag.				
δ		20° 30′	5° 33′	28° 20′
Wire	a			
"	b			
"	c			
"	1	10 12 40.1	7 32 23.4	7 37 12.7
"	2	44.0	27.0	17.1
"	3	48.0	30.9	21.2
"	4	51.8	34.3	25.2
"	5	55.6	38.0	29.5
"	d			
"	e			
"	f			
Sum		239.5	153.6	105.7
Mean		10 12 47.90	7 32 30.72	7 37 21.14
Red'n to m		+ +.56	+ +.56	+ +.56
n . tan. δ		+ −.16	+ −.24	+ −.11
c . sec. δ		−.01	−.01	−.01
τ				
T		10 12 48.29	7 32 31.03	7 37 21.58
a		10 12 41.73	7 32 23.16	7 37 13.67
Δ T		−6.56	−7.87	−7.91

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date 1868 15 June		June 15	June 15	June 16
Observer		M. C.	M. C.	A. S. W.
Illumin'n				
Star ε Bootis		ε Bootis	β Librae	α Ursæ Majoris
Mag.				
δ		27° 38′	8° 54′ S.	62° 28′
Wire	a			
"	b			
"	c			
"	1	14h 39m 19.4	15h 10m 2.0	10h 55m 30.3
"	2	23.4	5.5	38.3
"	3	27.7	9.2	46.3
"	4	31.8	12.7	53.1
"	5	35.8	16.4	56 1.4
"	d			
"	e			
"	f			
Sum		138.1	45.8	229.4
Mean		14 39 27.62	15 10 9.16	10 55 45.88
Red'n to				
m		+.56	+0.56	+.56 +.57
n. tan. δ		−.05	−0.53	+12 −.34
c. sec. δ		+.01	0.00	+02 .00
r				+
T		14 39 28.14 28.28	15 10 9.60 9.39	10 55 46.10
			[9.05]	10 55 46.58
a		14 39 14.94	15 9 52.39	10 55 32.87
Δ T		13.20 13.34	13.21 13.34	13.71 13.23

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

		June 16	June 17	June 19
Date				
Observer		A. S.	A. S.	A. S.
Illumin'n		W.	W.	W.
Star		δ Leonis	α Ursae Majoris	ε Leonis
Mag.				
δ		21° 15′	62° 28′	24° 23′
Wire	a			
"	b			
"	c			
"	1	11 7 11.1	10 55 31.4	9 38 30.1
"	2	15.0	39.2	33.7
"	3	18.9	47.0	38.0
"	4	22.7	54.9	41.8
"	5	26.6	56 2.1	45.9
"	d			
"	e			
"	f			
Sum		94.3	234.6	189.5
Mean		11 7 18.86	10 55 46.92	9 38 37.90
Red'n to m		+(+.56) .56	+(+.56) .56	+(+.56) .56
n. tan. δ		+(−.06) .17	−(+.12) .34	+(−.06) .15
c. sec. δ		(+.01) .00	(+.02) .00	(+.01) .00
r				
T		11 7 19.59	10 55 47.134	9 38 38.61
		11 7 19.37	10 55 47.62	9 38 38.41
a		11 7 5.58	10 55 32.84	9 38 21.21
Δ T		13.79 14.01	14.78 14.30	17.20 17.40

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		June 19	June 20	June 20
Observer		A. S. W.	A. S. W.	A. S. W.
Illumin'n				
Star		α Leonis	α Hydrae	ε Leonis
Mag.				
δ		12° 37′	8° 5′ S.	24° 23′
Wire	a			
"	b			
"	c			
"	1	10 1 30.1	9 21 16.8	9 38 31.2
"	2	33.7	20.6	35.1
"	3	37.5	23.8	39.0
"	4	41.1	27.7	43.1
"	5	44.9	31.6	47.0
"	d			
"	e			
"	f			
Sum		187.3	120.5	195.4
Mean		10 1 37.46	9 21 24.10	9 38 39.08
Red'n to m		+(+.56) .56	+(+.56) .56	+(+.56) .56
n. tan. δ		+(−.08) .23	+(−.13) .35	+(−.06) .15
c. sec. δ		(+.01) .00	(+.01) .00	(+.01) .00
r				
T		10 1 38.26	9 21 25.01	9 38 39.79
		10 1 37.95	9 21 24.54	9 38 39.59
a		10 1 20.57	9 21 6.10	9 38 21.20
Δ T		17.35 17.68	18.44 18.91	18.39 18.59

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		June 20	June 20	June 20
Observer		A. S.	A. S.	A. S.
Illumin'n		W.	W.	W.
Star		α Leonis	γ Leonis	α Ursae Majoris
Mag.				
δ		12° 37′	20° 30′	62° 28′
Wire	a			
"	b			
"	c			
"	1	10 1 31.1	10 12 51.9	10 55 35.0
"	2	34.9	55.7	42.7
"	3	38.6	59.7	50.5
"	4	42.2	13 3.5	58.2
"	5	46.0	7.3	56 6.2
"	d			
"	e			
"	f			
Sum		192.8	298.1	252.6
Mean		10 1 38.56	10 12 59.62	10 55 50.52
Red'n to m		+ (+.56) .56	+ (+.56) .56	+ (+.56) .56
n . tan. δ		+ (−.08) .23	+ (−.06) .18	− (+.12) .34
c . sec. δ		(+.01) .00	(+.01) .00	(+.02) .00
r				
T		10 1 39.35	10 13 0.36	10 55 50.74
		10 1 39.05	10 13 0.13	10 55 51.22
a		10 1 20.65	10 12 41.61	10 55 32.74
Δ T		18.40 18.70	18.52 18.75	18.48 18.00

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

		June 20	June 23	June 25
Date				
Observer		A. S.	A. S.	A. S.
Illumin'n		W.	W.	W.
Star		δ Leonis	γ Leonis	η Ursæ Majoris
Mag.				
δ		21° 15′	20° 30′	49° 59′
Wire	a			
"	b			
"	c			
"	1	11 7 15.7	10 12 55.9	13 42 34.4
"	2	19.8	59.8	40.2
"	3	23.6	13 3.7	45.9
"	4	27.4	7.6	51.3
"	5	31.2	11.4	57.1
"	d			
"	e			
"	f			
Sum		117.7	18.4	228.9
Mean		11 7 23.54	10 13 3.68	13 42 45.78
Red'n to m		+ (+.56) .56	+ (+.56) .56	+ .56
n. tan. δ		+ (−.06) .17	+ (−.06) .18	+ .03
c. sec. δ		(+.01) .01	(+.01) .00	+ .05
r				
T		11 7 24.27	10 13 4.42	13 42 46.42
		11 7 24.05	10 13 4.19	
a		11 7 5.54	10 12 41.58	13 42 21.13
Δ T		18.51 18.73	22.61 22.84	2529

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		June 25			June 25			June 25		
Observer		A. S. W.			A. S. W.			A. S. W.		
Illumin'n										
Star		γ Bootis			α Draconis			α Bootis		
Mag.										
δ		19° 4′			65° 1′			19° 52′		
Wire	a									
"	b									
"	c									
"	1	13	48	42.6	14	0	57.5	14	9	57.2
"	2			46.1		1	5.9		10	1.0
"	3			50.2			14.6			4.8
"	4			54.0			23.0			8.7
"	5			57.7			31.7			12.4
"	d									
"	e									
"	f									
Sum				250.6			72.7			24.1
Mean		13	48	50.12	14	1	14.54	14	10	4.82
Red'n to										
m			+	.56	+		.56	+		.56
n. tan. δ			−	.07	+		.15	−		.07
c. sec. δ			+	.03	+		.07	+		.03
τ										
T		13	48	50.64	14	1	15.32	14	10	5.34
a		13	48	25.27	14	0	49.89	14	9	39.81
Δ T				25.37			25.43			25.53

June 25. Instrument reversed

$n = +.56$ $n = +.12$ $c = +.03$ (H. W.)

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		June 25	June 25	June 25
Observer		A. S.	A. S.	A. S.
Illumin'n		W.	W.	W.
Star		ε Cassiopeæ	ν Bootis	5 Ursæ Minoris
Mag.				
δ		66° 48′	52° 28′	76° 17′
Wire	a			
"	b			
"	c			
"	1	14 18 21.3	14 20 56.3	14 27 45.6
"	2	30.2	21 2.2	28 0.6
"	3	39.6	8.1	16.0
"	4	48.9	14.0	30.7
"	5	58.0	20.0	46.5
"	d			
"	e			
"	f			
Sum		198.0	40.6	79.4
Mean		14 18 39.60	14 21 8.12	14 28 15.88
Red'n to				
m		+ .56	+ .56	+ .56
n. tan. δ		− .39	+ .05	+ .38
c. sec. δ		− .08	+ .05	+ .13
r				
T		14 18 39.69	14 21 8.78	14 28 16.95
a		2 18 14.31	14 20 43.31	14 27 51.45
Δ T		25.38	25.47	25.50

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

		June 25			June 25			June 30		
Date										
Observer		A. S.			A. S.			A. S.		
Illumin'n		W.			W.			W.		
Star		ε Bootis			α² Librae			α Leonis		
Mag.										
δ		27° 38′			15° 30′ S.			12° 37′		
Wire	a									
"	b									
"	c									
"	1	14	39	31.7	14	43	54.5	10	1	44.8
"	2			35.7			58.0			48.5
"	3			39.9		44	1.9			52.3
"	4			43.8			5.4			55.9
"	5			47.9			9.4			59.8
"	d									
"	e									
"	f									
Sum				199.0			9.2			261.3
Mean		14	39	39.80	14	44	1.84	10	1	52.26
Red'n to										
m		+		.56	+		.56	+		.56
n. tan. δ		−		.05	−		.13	−		.08
c. sec. δ		+		.03	+		.03	+		.03
r										
T		14	39	40.34	14	44	2.30	10	1	52.77
a		14	39	14.83	14	43	36.76	10	1	20.48
Δ T				25.51			25.54			32.29

June 25. Mean of 9 stars
Δ T = 25.45

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		June 30			July 1			July 1			
Observer		A. S. W.			E. P. A. W.			E. P. A. W.			
Illumin'n											
Star		γ Leonis			ε Bootis			α² Librae			
Mag.											
δ		20° 30′			27° 38′			15° 30′ S.			
Wire	a										
"	b										
"	c										
"	1	10	13	5.7	14	39	40.1	14	44	3.0	
"	2			9.6			44.2			6.8	
"	3			13.5			48.4			10.7	
"	4			17.2			52.3			14.2	
"	5			21.2			56.6			18.0	
"	d										
"	e										
"	f										
Sum				67.2			241.6			52.7	
Mean		10	13	13.44	14	39	48.32	14	44	10.54	
Red'n to											
m		+		.56	+.56		+.56	+.56		+.56	
n . tan. δ		−		.06	−.08		+ 3	−.24		+ 3	
c . sec. δ		+		.03	+.02		− 5	+.02		− 16	
r											
T		10	13	13.97	14	39	48.52	14	44	10.88	
a		10	12	41.53	14	39	14.77	14	43	36.71	
Δ T				32.44			34.05 34.09			34.17 34.26	

$\bar{m}$ = .56 assumed
c = +.03
m = +.128
ΔT at July 1.6 = − 34.12

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

		July 1	July 1	July 1
Date				
Observer		E.P.A.	E.P.A.	E.P.H.
Illumin'n		W.	W.	W.
Star		β Ursæ Min.	β Bootis	48 Cephei
Mag.				
δ		74° 42′	40° 55′	77° 14′
Wire	a			
"	b			
"	c			
"	1	14 51 14.5	14 57 23.7	15 3 42.6
"	2	27.1	28.2	59.0
"	3	41.3	33.3	4 15.1
"	4	54.7	38.0	31.7
"	5	52 8.5	43.0	48.0
"	d			
"	e			
"	f			
Sum		206.1	168.2	76.4
Mean		14 51 41.22	14 57 33.64	15 4 15.28
Red'n to				
m		+.56 56	+.56 56	+.56 56
n . tan. δ		+.55 37	−.01 −1	−1.06 −68
c . sec. δ		+.06 1	+.02 +2	−.07 −14
r				
T		14 51 42.39	14 57 34.21	15 4 14.71
a		14 51 8.37	14 56 59.84	3 3 41.02
Δ T		34.02 33.89	34.27 34.37	33.69 34.00

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		July 1	July 1	July 1
Observer		E. P. A.	E. P. A.	E. P. A.
Illumin'n		W.	W.	W.
Star		β Librae	μ' Bootis	γ^2 Ursæ Min.
Mag.				
δ		8° 54' N.	37° 51'	72° 19'
Wire	a			
"	b			
"	c			
"	1	15 10 22.8	15 19 56.0	15 21 8.9
"	2	26.4	20 0.6	20.5
"	3	30.0	5.3	32.0
"	4	33.7	9.8	44.3
"	5	37.4	14.8	56.5
"	d			
"	e			
"	f			
Sum		150.3	26.5	162.2
Mean		15 10 30.06	15 20 5.30	15 21 32.44
Red'n to				
m		+.56 ~~56~~	+.56 ~~56~~	+.56 ~~56~~
n. tan. δ		−.21 ~~−14~~	−.03 ~~−2~~	+.45 ~~19~~
c. sec. δ		+.02 ~~+13~~	+.02 ~~+4~~	+.05 ~~10~~
r				
T		15 10 30.43	15 20 5.85	15 21 33.50
a		15 9 56.35	15 19 31.87	15 20 59.27
Δ T		34.08 ~~34.16~~	33.98 ~~34.01~~	34.23 ~~34.02~~

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		July 1	July 1	July 1
Observer		E.P.A.	E.P.A.	E.P.A.
Illumin'n		W.	W.	W.
Star		α Coronæ Bor.	τ Herculis	α Scorpii
Mag.				
δ		27° 10′	46° 38′	26° 8′ S.
Wire	a			
"	b			
"	c			
"	1	15 29 33.0	16 16 11.0	16 21 47.4
"	2	36.9	16.6	51.7
"	3	41.1	21.5	55.6
"	4	45.3	27.1	59.8
"	5	49.5	32.4	22 3.7
"	d			
"	e			
"	f			
Sum		205.8	108.6	278.2
Mean		15 29 41.16	16 16 21.72	16 21 55.64
Red'n to				
m		+.56 56	+.56 56	+.56 56
n . tan. δ		−.08 −5	+.03 2	−.28 −18
c . sec. δ		+.02 3	+.02 2	+.02 3
r				
T		15 29 41.66	16 16 22.33	16 21 55.94
a		15 29 7.67	16 15 48.27	16 21 21.64
Δ T		33.99 34.03	34.06 34.07	34.30 34.41

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		July 2	July 3	July 3
Observer		N. S.	E. P. A.	E. P. A.
Illumin'n		W.	W.	W
Star		δ Ophiuchi	β Librae	μ' Bootis
Mag.				
δ		3° 21′ S.	8° 54′ S.	37° 51′
Wire	a			
"	b			
"	c			
"	1	16 7 55.5	15 10 25.4	15 19 59.0
"	2	59.0	29.0	20 3.4
"	3	8 2.8	32.9	8.1
"	4	6.2	36.2	12.5
"	5	9.9	40.0	17.0
"	d			
"	e			
"	f			
Sum		13.4	163.5	40.0
Mean		16 8 2.68	15 10 32.70	15 20 8.00
Red'n to m		+.56 56	+.56 56	+.56 56
n. tan. δ		−.19 −12	−.21 −14	−.03 −1
c. sec. δ		+.01 3	+.02 +3	+.02 +4
r		1 3.45	33.15	8.59
T		16 8 3.06	15 10 33.07	15 20 8.55
a		16 7 27.90	15 9 56.34	15 19 31.84
Δ T		35.16 35.25	36.73 36.81	36.71 36.75

Constants assumed same as July 1.

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		July 3	July 4	July 4
Observer		E. P. A.	E. P. A.	E. P. A.
Illumin'n		W.	W.	W.
Star		γ^2 Urs. Minoris	ε Bootis	α^2 Librae
Mag.				
δ		72° 19′	27° 38′	15° 30′ S.
Wire	a			
"	b			
"	c			
"	1	15 21 11.5	14 39 44.2	14 44 7.0
"	2	23.1	48.2	10.8
"	3	35.0	52.3	14.3
"	4		56.4	18.1
"	5	58.8	40 0.6	22.0
"	d			
"	e			
"	f			
Sum			261.7	72.2
Mean			14 39 52.34	14 44 14.44
Red'n to				
m			+.56 56	+.56 56
n . tan. δ			−.08 − 5	−.24 − 15
c . sec. δ			+.02 + 3	+.02 + 3
r			52.88	14.88
T			14 39 52.84	14 44 14.78
a		15 20 59.17	14 39 14.73	14 43 36.69
Δ T			38.11 38.15	38.09 38.19

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		July 10			July 10			July 10			
Observer		A. S.			A. S.			A. S.			
Illumin'n		W.			W.			W.			
Star		ε Serpentis			Gr. 2320			τ Herculis			
Mag.											
δ		6° 51′			68° 10′			46° 38′			
Wire	a										
"	b										
"	c										
"	1	15	44	56.9	16	6	28.2	16	16	25.4	
"	2		45	0.4			37.8			30.8	
"	3			4.0			47.6			35.8	
"	4			7.8			57.0			41.0	
"	5			11.2		7	7.1			46.5	
"	d										
"	e										
"	f										
Sum				20.3			237.7			179.5	
Mean		15	45	4.06	16	6	47.54	16	16	35.90	
Red'n to											
m				+.74			+.74			+.74	
n. tan. δ				−.19			+.37			+.03	
c. sec. δ				+.01			+.04			+.02	
r											
T		15	45	4.62	16	6	48.69	16	16	36.69	
a		15	44	16.15	16	6	0.14	16	15	48.13	
Δ T				48.47			48.55			48.56	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date		July 10			July 10			
Observer		E. S.			E. P. A.			
Illumin'n		W.			W.			
Star		α Scorpii			κ Ophiuchi			
Mag.								
δ		26° 8′ S.			9° 35′			
Wire	a							
"	b							
"	c							
"	1	16	22	1.8	16	52	8.1	
"	2			5.5			11.8	
"	3			9.8			15.6	
"	4			13.7			19.0	
"	5			17.8			23.0	
"	d							
"	e							
"	f							
Sum				48.6			77.5	
Mean		16	22	9.72	16	52	15.50	
Red'n to								
m				+.74			+.74	
n . tan. δ				−.32			−.17	
c . sec. δ				+.02			+.02	
r								
T		16	22	10.16	16	52	16.09	
a		16	21	21.60	16	51	27.34	
Δ T				48.56			48.75	

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

Date			
Observer Illumin'n			
Star Mag. δ			
Wire a " b " c " 1 " 2 " 3 " 4 " 5 " d " e " f			
Sum Mean			
Red'n to m n . tan. δ c . sec. δ			
τ			
T a			
Δ T			

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1967phae.proj..336A

Date				
Observer				
Illumin'n				
Star				
Mag.				
δ				
Wire	a			
"	b			
"	c			
"	1			
"	2			
"	3			
"	4			
"	5			
"	d			
"	e			
"	f			
Sum				
Mean				
Red'n to				
m				
n . tan. δ				
c . sec. δ				
τ				
T				
a				
Δ T				

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1867phae.proj..336A

g

Feb 16 +34·3

Feb 20 +30·9

28 + 22·

Mar 2 8 P.M. + 41·6

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S

1007MNRAS.proj..336A

John G. Wolbach Library, Harvard-Smithsonian Center for Astrophysics • Provided by the NASA Astrophysics Data S