

KG
11366
097

7

KG 11366.097

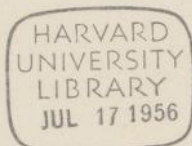
CH Payne

Emission lines et. al.

apertured spectra with 11-inch



KG 11366.097



Bright Line Stars.

1. H plates of O stars . page 4
2. MC 21638 γ Cas 26

H-Plates of O Stars. (Short dispersion. 14ford plates)

No.	R.A. h	Dec.	Object	
✓ H 1790	6 52 ^m	-23.8	-23° 4553	Ob ✓
✓ H 1796	6 50	-23.8	-23° 4553	Ob ✓
✓ H 2235	22 8	+58.56'	+58° 2402	Od ✓
✓ H 2237	22 8	+58.9	+58° 2402	Od ✓
✓ H 2238	22 8	+58.9	λ Cep	
✓ H 2243	20 17.8	+36.36'	+36° 4028	Oa ✓
✓ H 2244	20 17.8	+36.36'	+36° 4028	Oa ✓
✓ H 2245	19 ^h 44.1 19 59.8	+17.57 +35.7	+35° 3930	Oa ✓ Oe ✓
✓ H 2248	19 59.8	+35.7	+35° 3953	Op ✓
✓ H 2249	19 59.8	+35.7	+35° 4001	Ob ✓
✓ H 2251	19 59.8	+35.7	+35° 4013	Oa ✓
✗ H 2252	1		+36° 4956 RS Cyg	Oa ✓ O star useless
✓ H 2255	19 44.1	+17.57'	—	
✗ H 2256	19 30.8	+30 18	H Envelope star	
✓ H 2256	19 30.8	+30 18		BD 30° 3639
✓ H 2258	20 15.8	+28.35'	+38° 4010	Ob ✓
✓ H 2259		+60.0		
✓ H 2261	20 7	+11.35'	See page —	Oa ✓
✓ H 2262	20 7.1	+11.° 35'	20-21 —	Oa ✓
✓ H 2267	22 32.9	+56.23'	+56° 2818	Ob ✓
✓ H 2246			+35° 3930	Oe ✓
			+35° 3953	Op ✓
			+35° 4001	Ob ✓
			+35° 4013	Oa ✓
✓ H 1783			Pleiades. Standard.	

Measures of H plates enumerated on p. 4.

 $+23^{\circ}45'53''$

4650-1.3

H 1790

R.A. $6^h 52$ Dec -23.8

Measures from 4650

Pos. Int. λ

0 1

+1.3 5

+7.2 1

+9.8 1

+11.1 1

Measurement of plates

Ryppiece scale graduated in fiftieths of a centimeter.

Left hand horizontal scale used.

Measures made from 4633-50, or from H/3,

centering on the band, in each case, red = +

Intensities of bright bands only are given on the following scale.

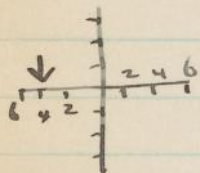
1 = just seen

2 = clear

3 = strong

4 = very strong

5 = " " and very wide



6

H 1796

B.D. $\overline{723}^{\circ} 4553$. Excellent. DiyaninPos. Int. λ

7.0

1

9.9

1

from 4686(5) - 1.3

H 2235

Wrong star: ν Cephei.

7.

8

H 2237

3 Cephei. ordinary plate, focus poor.

No bright line seen except 4686

H 2238

J Cephei

Excellent plate.

4686 bright.

No other bright line seen.

10

H 2243

 $+36^{\circ}4026$

from 4650

Pos.	Int.	λ
0	4	
6.4	3	
9.0	2	

H 2248

 $+35^{\circ} 4001$

from 4686

P_0	int.	λ
0	4	
5.0	1	
7.6	1	
8.9	2	

 $+35^{\circ} 3956$
 ~~$+35^{\circ} 4013$~~

" "

0	5
6.0	1
6.4	4
9.0	2

 $+35^{\circ} 4013$
 ~~$+35^{\circ} 3956$~~

0	5
6.0	1
6.4	4
9.0	2

 $+36^{\circ} 3987$

0	4
9.0	2

12

H 2245

 $19^h 59.8 \quad +35.7$ $+35^\circ 39' 30.$ Poor focus

4640, 4686 bright

No other bright lines seen

 $19^h 44. \quad +17 57$ ~~$20^h 7.1 \quad +11 35$~~

Very faint

One sharp bright line seen. B star?

H 2246 Sep. 23

H 2248

+ 36° 40 28 From only visible line

Pos. Int.

6.0 0-1

14

H 2249

Pos.	Int.	λ
0	2	
+1.3	5	
3.0	2	
6.0	2	
9.8	3	

H 2251

+37° 38' 21"

Excellent

Std 4650-1.3

Pos.	Int.	λ
------	------	-----------

2.7	2	
-----	---	--

6.0	2	
-----	---	--

7.9	2	
-----	---	--

10.0	3	
------	---	--

RS Cygni on this plate. near minimum

H 2252

16

H 2255

19 44.1 +17 57

Two bright lines very faintly seen.
Not measurable.

H 2256

B D $30^{\circ} 36' 39''$

No bright line seen to yellow of 4650

18

H 2258

H 2259

H 2261

*

 $20^h 7.1 + 11 35$

0 star out of field

Nearby star with bright H α

X

This is not $20^h 7.1 + 11 35$, but the planetary nebula B.D. $+12^\circ 42' 66''$ given in the HDC as H.D. The nearby star is B.D. $+12^\circ 42' 68''$ not in the H.D.C. Bright H α to be announced in HB 836

H 2262

*

20 7.1 +11 35

Only one bright line seen.

Nearby star with bright $H\alpha$

*

See previous page

22

H 2267

 $+56^{\circ} 2818'$ Pos Int. λ

0 2

 $+8.9?$ 1

possibly only end of c.B.

H 2246

+35°4001 . straight-line image. 4650-1.3 standard

Distance Int. λ

+1.3 4

+5.9 2

+6.7 1

+9.8 2

+35°4013 straight line image.

Edge of plate 4650 standard

0 4

6.3 2

8.5 1

24

H1783

Pleiades. Scale plate

-6.7	H δ	4101
-4	H γ	4340
0	H β	4861
+8.6	H α	6560

Summary of measures, reduced to λ by
means of the scale plate

λ	Oa +36°4028 2 pl.	Oa +35°4013 2 pl.	Oa +36°3956 1 pl.	Ob -23°4553	Ob +35°4001	Ob +36°3821	Op +35°3953	Oc +36°3957
4686	3,3	5,4	5	5,5	4,4	5,5	✓	4
4861	-	-	-	-	-	2,2		-
5464-80	-	-	-	-	5411 1,2	5411 2,2		-
5694	-	1	1	(1,1)	?	-		-
5812	1,3	4,2	4	↓ -	-	5877 2		-
6563	2,2	2,1	2	1,1	5877 2 2,2	3,3		2

Plate MC 21638, apertured. Record books. Copied from Bk 3 p. 100

α	Start	Stop	Load	Focus	Aperture	Sky	Clouds	Trace
γ Cassiopeiae	$2^h 3^m 56^s$	$0^h 16^m$	225	17.2	1	0?	0?	✓

	0 18	0 40	"	"	2	0?	-	✓
--	------	------	---	---	---	----	---	---

	0 42	1 02	"	"	3	-	0	✓
--	------	------	---	---	---	---	---	---

	1 04	1 24	"	"	4	T	0	✓
--	------	------	---	---	---	---	---	---

	1 26	1 46	"	"	1	T	0	-
--	------	------	---	---	---	---	---	---

	1 50	2 10	"	"	1	T	0	-
--	------	------	---	---	---	---	---	---

Microphotometer records from $H\beta$ over $H\gamma$ made by
CHP, 1926 May 22.

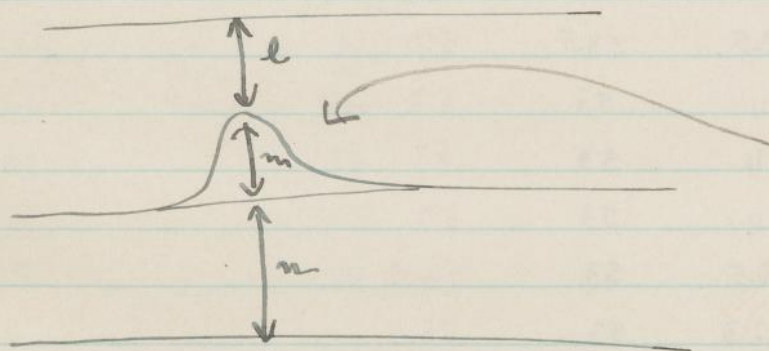
Remainder of the spectrum clearly unmeasurable;
neither absorption nor emission lines show
enough contrast to be distinguished from plate
grain.

Measurement of microphotometer records. Method of Books 3 and 6. Half mm. scale used; laid direct on the trace, one setting for $H\beta$, one for $H\gamma$. Scale is another copy of the one used in Bk. 3 and 6.

Over emission line, readings made for every half mm, arranged symmetrically around the record denoting the line center, ^{violet} ~~red~~ being put first.

From $H\beta$ to red, readings made every 5 scale divisions (2.5 mm) in order to make a possible calibration curve.

Line measured from center of line on trace



N.B. This really is the right way up.
This is an Emission Line

Observed and assumed quantities are in black
Derived quantities in red

28

MC 216 38

Aperture 1'

	ℓ	m	n	$m+n$
--	--------	-----	-----	-------

3.2	1	57	58
-----	---	----	----

3	1	57	58
---	---	----	----

2.5	1.5	57	58.5
-----	-----	----	------

2.5	1.5	57	58.5
-----	-----	----	------

H γ 2	3	57	59
--------------	---	----	----

2	1.5	57	58.5
---	-----	----	------

2	1.5	57	58.5
---	-----	----	------

2.5	1	57	58
-----	---	----	----

3	0.5	57	57.5
---	-----	----	------

3	0.5	57	57.5
---	-----	----	------

3.5	1	54	55
-----	---	----	----

3	1.5	54	55.5
---	-----	----	------

2.5	2	54	56
-----	---	----	----

2	3	53.5	56.5
---	---	------	------

1.5	3.5	53.5	57
-----	-----	------	----

1	4	53	57
---	---	----	----

H β 1	4	53	57
-------------	---	----	----

1	4	53	57
---	---	----	----

1.5	3.5	53	56.5
-----	-----	----	------

2.5	2.5	53	55.5
-----	-----	----	------

3.5	1.5	53	54.5
-----	-----	----	------

4.5	0.5	53	53.5
-----	-----	----	------

From H β to n 4.5	0.5	53	53.5
---------------------------	-----	----	------

5.5	-	52.5	52.5
-----	---	------	------

6	-	52	52
---	---	----	----

6	-	52	52
---	---	----	----

6.5	-	51.5	51.5
-----	---	------	------

7.5	-	50.5	50.5
-----	---	------	------

7.5	-	50.5	50.5
-----	---	------	------

8	-	50	50
---	---	----	----

l	m	n $= m+n$
8.5	-	49.5
8	-	50
9.5	-	48.5
10.5	-	47.5
11.5	-	46.5
11.5	-	46.5
12	-	46
14	-	44
14	-	44
15.5	-	42.5
16.5	-	41.5
18	-	40
19.5	-	38.5
20	-	38
20.5	-	37.5
22	-	36
26	-	32
26	-	32
28	-	30
29	-	29
30	-	28
32	-	26
33	-	25
35	-	23
36	-	22
38	-	20
39	-	19
39	-	19
Area of $H\gamma$		$= 10$
Area of $H\beta$		$= 25$

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MC 21638

Aperture 2

H γ

λ	m	n	$m+n$
10	0	51	51
9.5	0.5	51	51.5
9.5	0.5	51	51.5
9	1	51	52
8.5	1.5	51	52.5
8	2	51	53
7.5	2.5	51	53.5
7.5	2.5	51	53.5
7.5	2.5	51	53.5
8	2	51	53
9	1	51	52
9.5	0.5	51	51.5
10	0	51	51
10.5	-0.5	51	50.5
10.5	-0.5	51	50.5
10	0	51	51

H β

14.5	0	43	43
14	1	43	44
13.5	1.5	43	44.5
12	3	43	46
10.5	4.5	43	47.5
9.5	5.5	43	48.5
9	6	43	49
8.5	6.5	42.5	49
8.5	6.5	42.5	49
8	7.5	42.5	50
8.5	7	42.5	49.5
10	5.5	42.5	48
12.5	3	42.5	45.5
15	1	42.5	43
16	0	42.5	42

Red from	l	m	n $= m+n$
$H\beta, 25\text{ mm}$	16	-	42
	16.5	-	41.5
	17.5	-	40.5
	18.5	-	39.5
	19.5	-	38.5
	19.5	-	38.5
	20.5	-	37.5
	21.5	-	36.5
	22.5	-	35.5
	22.5	-	35.5
	25	-	33
	26	-	32
	26	-	32
	27.5	-	30.5
	28	-	30
	29	-	29
	30	-	28
	31.5	-	26.5
	33.5	-	24.5
	34.5	-	23.5
	36.5	-	21.5
	36.5	-	21.5
	36.5	-	21.5
	38.5	-	19.5
	39.5	-	18.5
	41.5	-	16.5
	42.5	-	15.5
	44	-	14

Area of $H\gamma = 19$
 area of $H\beta = 54$

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MC 21638

Aperture 3

Hy

l	m	n	$m+n$
26.5	-1.5	33.5	32
26.5	-1.5	33.5	32
26	-1	33.5	32.5
26	-1	33.5	32.5
26.5	-1.5	33.5	32
25.5	-0.5	33.5	33
25	0	33.5	33.5
24.5	0.5	33.5	34
24.5	1.5	33.5	35
22.5	2.5	33.5	36
21.5	3.5	33.5	37
21	4.0	33.5	37.5
22	3.0	33.5	36.5
22.5	2.5	33.5	36
24	1	33.5	34.5
25.5	-0.5	33.5	33
26	-1	33.5	32.5
26.5	-1.5	33.5	32
26	-1	33.5	32.5
25.5	-0.5	33.5	33
26	-1	33.5	32.5
26	-1	33.5	32.5
25	0	33.5	33.5
25	0	33.5	33.5

37	0	21	21
35	2	21	23
34	3	21	24
31.5	5.5	21	26.5
29	8	21	29

	l	m	n	$m+n$
	27.5	9.5	21	30.5
	27	10	21	31
	26.5	10.5	21	31.5
H β	26.5	10.5	21	31.5
	27	10.5	20.5	31
	29.5	~~7.5~~ 8	20.5	28.5
	32.5	4.5	20.5	25.5
	35	2.5	20.5	23
	36.5	~~0.5~~ 1.0	20.5	21.5
	38	0	20.5	20.5

2.5 mm ^{to} H β	36.5	-	21.5
	39	-	19
	40	-	18
	40	-	18
	41	-	17
	42	-	16
	41.5	-	16.5
	43.5	-	14.5
	43.5	-	14.5
	43.5	-	14.5
	45	-	13
	45	-	13
	47	-	11

Area of H γ = 18

Area of H β = 75

uc 21638

Aperture 4

Second

adjustment.

H γ

l	m	n	$m+n$
48	0	11	11
47	1	11	12
46.5	9.5	11	12.5
46	2	11	13
45	3	11	14
44	4	11	15
44	4	11	15
45	8	11	14
46	2.5	11	13
46	2	11	13
46.5	1.5	11	12.5
47.5	0.5	11	11.5
48	0	11	11
49	-1	11	10
48.5	-0.5	11	10.5
48	0	11	11

H β

50	0	7.5	7.5
49.5	0.5	7.5	8
49	1	7.5	8.5
49	1	7.5	8.5
48.5	1.5	7.5	9
48	2	7.5	9.5
47	3	7.5	10.5
46	4	7.5	11.5
45	5	7.5	12.5
44	6	7.5	13.5
44	6	7.5	13.5
44.5	5.5	7.5	13
46.5	3.5	7.5	11

l	m	n	
48.5	1.5	7.5	9
50	0	7.5	7.5
50	0	7.5	7.5
<i>mtn</i>			
50	-	7.5	
51	-	6.5	
52	-	5.5	
51	-	6.5	
52	-	5.5	
52	-	5.5	
52.5	-	5	
53	-	4.5	
53	-	4.5	
53	-	4.5	
54	-	3.5	
53	-	4.5	
54	-	3.5	

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Reductions, $H\gamma$

aperture

	m				$m + m$			
	1	2	3	4	1	2	3	4
							32	
							32	
							32.5	
							32.5	
						51	32	
						51.5	33	11
						51.5	33.5	12
					58	52	34	12.5
					58	52.5	35	13
					58.5	53	36	14
					58.5	53.5	37	15
$H\gamma$	57	57	33.5	11	59	53.5	37.5	15
					58.5	53.5	36.5	14
					58.5	53	36	13
					58	52	34.5	13
					57.5	51.5	33	12.5
					57.5	51	32.5	11.5
						50.5	32	11
						50.5	32.5	10
						51	33	10.5
							32.5	11
							32.5	
							33.5	
							33.5	

Ratio in log aperture, background minus line

ap. 1	2	3	4
		.64-.61 +3	
		.61 +3	
		.62 +2	
		.62 +2	
	.98-.98 0	.61 +3	
	.99 -1	.63 +1	.31-.31 0
	.99 -1	.64 0	-.33 -2
1.17-1.21 -.04	1.00 -2	.65 -1	-.34 -3
1.21 -.04	1.02 -4	.66 -2	-.35 -4
1.23 -.06	1.03 -5	.68 -4	-.37 -6
1.23 -.06	1.04 -6	.70 -6	-.38 -7
1.26 -.09	1.04 -6	.71 -7	-.38 -7
1.23 -.06	1.04 -6	.69 -5	-.37 -6
1.23 -.06	1.03 -5	.68 -4	-.35 -4
1.21 -.04	1.00 -2	.65 -1	-.35 -4
1.19 -.02	.99 -1	.63 +1	-.34 -3
1.19 -.02	.98 0	.62 +2	-.33 -2
	.97 +1	.61 +3	-.31 0
	.97 +1	.62 +2	-.29 +2
	.98 0	.63 +1	-.30 +1
		.62 +2	-.31 0
		.62 +2	
		.64 0	
		.64 0	

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Reductions, $H\beta$

m m

Aperture

	1	2	3	4	1	2	3	4
						43		7.5 8
						44	21	8.5
						44.5	23	8.5
					55	46	24	9
					55.5	47.5	26.5	10.5
					56	48.5	29	10.5
					56.5	49	30.5	11.5
					57	49	31	12.5
					57	49	31.5	13.5
					57	50	31.5	13.5
					57	49.5	31	13
					56.5	48	28.5	11
					55.5	45.5	25.5	9
					54.5	43	23	7.5
					53.5	42	21.5	7.5
							20.5	
$H\beta$	53	42.5	21	7.5				

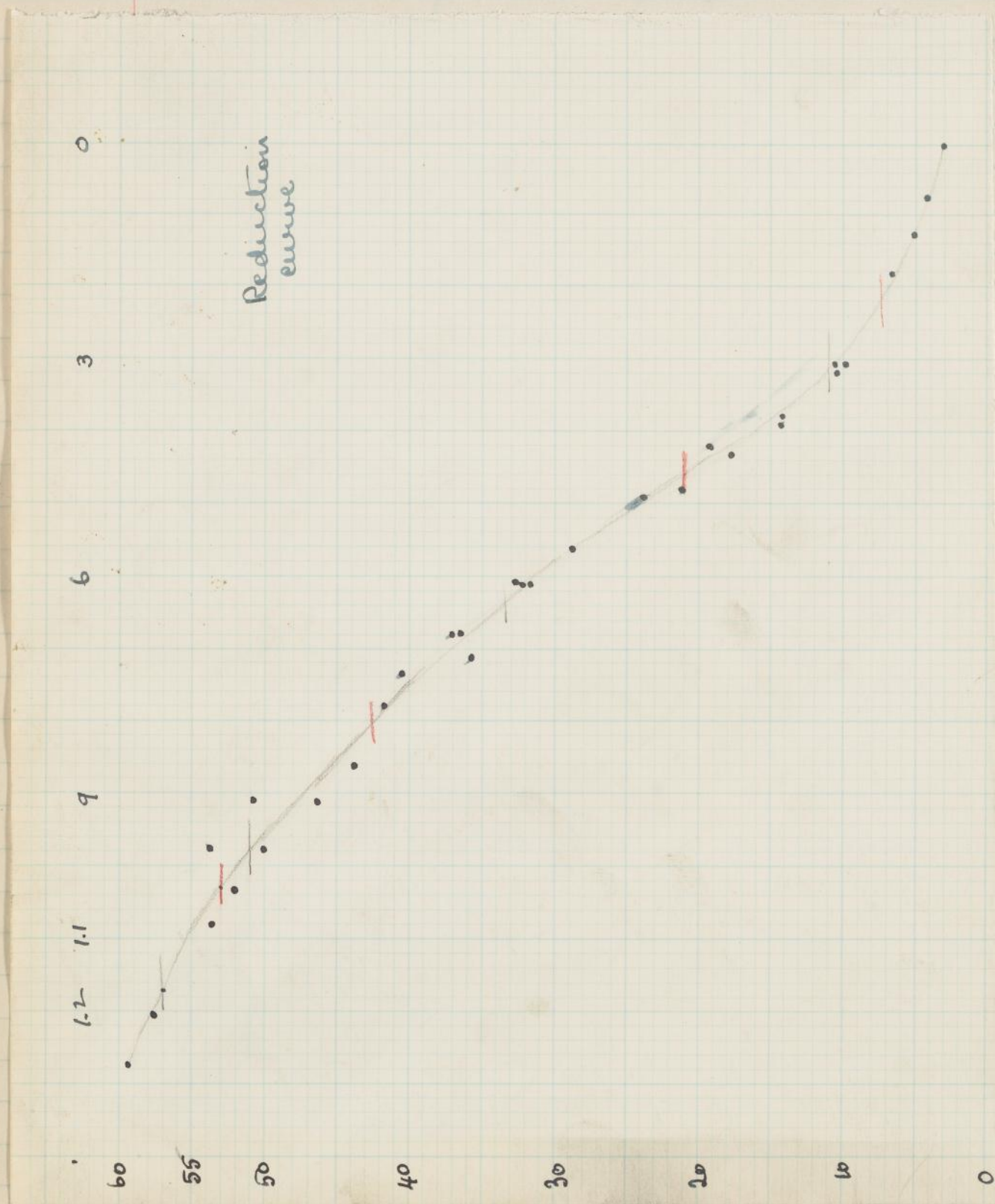
ap1	Ratio in log aperture				4
	2	3	4	5	
		.80-.81	-.01		.22-.22 0
					.24 -.02
		.83	3	.46-.46 0	.25 3
		.85	5	.48 -.02	.25 3
1.03-1.08	-.05	.88	8	.50 4	.26 4
1.10	7	.91	11	.53 7	.28 6
1.13	10	.93	13	.56 10	.30 8
1.14	11	.94	14	.59 13	.32 10
1.17	14	.94	14	.60 14	.35 13
1.17	14	.94	14	.60 14	.36 14
1.17	14	.96	16	.60 14	.36 14
1.17	14	.95	15	.60 14	.36 14
1.14	11	.92	12	.56 10	.31 9
1.10	7	.86	6	.52 6	.26 4
1.07	4	.81	1	.48 2	.22 0
1.04	1	.79	+1	.46 0	.22 0
				.45 +1	

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Material for reduction curve

Aperture
Red
from
H β

1	2	3	4
53.5	42	21.5	7.5
52.5	41.5	19	6.5
52	40.5	18	5.5
52	39.5	18	6.5
51.5	38.5	17	5.5
50.5	38.5	16	5.5
50.5	37.5	16.5	5
50	36.5	14.5	4.5
49.5	35.5	14.5	4.5
50	35.5	14.5	4.5
48.5	33	13	3.5
47.5	32	13	4.5
46.5	32	11	3.5
46.5	30.5		
46	30		
44	29		
44	28		
42.5	26.5		
41.5	24.5		
40	23.5		
38.5	21.5		
38	21.5		
37.5	21.5		
36	19.5		
32	18.5		
32	16.5		
30	15.5		
29	14		
28			
26			



Where no
sign is
given, the
quantity is
minus

Reduction to magnitudes.

H _γ	log ap, in hundredths of one ¹ / ₁₀ Mag.)				Mean	Residuals
- , - , +3 , -	-	-	~~+0.08~~	-	~~+0.08~~	-
- , - , +3 , -	-	-	~~+0.08~~	-	~~+0.08~~	-
- , - , +2 , -	-	-	~~+0.05~~	-	~~+0.05~~	-
- , - , +2 , -	-	-	~~+0.05~~	-	~~+0.05~~	-
- , 0 , +3 , -	-	0	~~+0.08~~	-	~~+0.04~~	- , 4 , 4 ,
- , -1 , +1 , 0	-	.02	~~+0.02~~	0	0	2 , 2 , 0
- , -1 , 0 , -2	-	.02	0	.05	~~-0.02~~	0 , 2 , 3
-4 , -2 , -1 , -3	.10	.05	.02	.08	~~-0.06~~	4 , 1 , 4 , 2
-4 , -4 , -2 , -4	.10	.10	.05	.10	~~-0.09~~	1 , 1 , 4 , 1
6 , 5 , 4 , 6	.15	.12	.10	.15	~~-0.13~~	2 , 1 , 3 , 2
6 , 6 , 6 , 7	.15	.15	.15	.18	~~-0.16~~	1 , 1 , 1 , 2
H _γ 9 , 6 , 7 , 7	.22	.15	.18	.18	~~-0.18~~	4 , 3 , 0 , 0
6 , 6 , 5 , 6	.15	.15	.12	.15	~~-0.14~~	1 , 1 , 2 , 1
6 , 5 , 4 , 4	.15	.12	.10	.10	~~-0.12~~	3 , 0 , 2 , 2
4 , 2 , 1 , 4	.10	.05	.02	.10	~~-0.07~~	3 , 2 , 5 , 3
2 , 1 , +1 , 3	.05	.02	~~+0.02~~	~~+0.08~~	~~-0.03~~	2 , 1 , 5 , 5
2 , 0 , +2 , 2	.05	0	~~+0.05~~	.05	~~-0.01~~	4 , 0 , 6 , 4
- , +1 , +3 , 0	-	~~+0.02~~	~~+0.08~~	0	~~+0.03~~	- , 1 , 5 , 3
- , +1 , +2 , +2	-	~~+0.02~~	~~+0.05~~	~~+0.05~~	~~+0.04~~	- , 2 , 1 , 1
- , 0 , +1 , +1	-	0	~~+0.02~~	~~+0.02~~	~~+0.01~~	- , 1 , 1 , 1
- , - , +2 , 0	-	-	~~+0.05~~	0	~~+0.02~~	- , - , 3 , 2
- , - , +2 , -	-	-	~~+0.05~~	-	~~+0.05~~	- , - , 0 , -
- , - , 0 , -	-	-	0	-	0	-
- , - , 0 , -	-	-	0	-	0	-

Log ap, in hundredths	H β in Mag.				Mean	Residuals
	-	-	-	0		
- , - , - , 0	-	-	-	0	0	-
- , 1 , - , 2	-	.02	-	.05	-.04	- , 2 , 1 ,
- , 3 , 0 , 3	-	.08	0	.08	-.05	- , 3 , 5 , 3
- , 5 , 2 , 3	-	.12	.05	.08	-.08	- , 4 , 3 , 0
5 , 8 , 4 , 4	.12	.20	.10	.10	-.13	1 , 7 , 3 , 3
7 , 11 , 7 , 6	.18	.28	.18	.15	-.20	2 , 8 , 2 , 5
10 , 13 , 10 , 8	.25	.32	.25	.20	-.26	1 , 6 , 1 , 6
11 , 14 , 13 , 10	.28	.35	.32	.20	-.29	1 , 6 , 3 , 9
14 , 14 , 14 , 13	.35	.35	.35	.32	-.34	1 , 1 , 1 , 2
14 , 14 , 14 , 14	.35	.35	.35	.35	-.35	0 , 0 , 0 , 0
H β 14 , 16 , 14 , 14	.35	.40	.35	.35	-.36	1 , 4 , 1 , 1
14 , 15 , 14 , 14	.35	.38	.35	.35	-.36	1 , 2 , 1 , 1
11 , 12 , 10 , 9	.28	.30	.25	.22	-.26	2 , 4 , 1 , 4
7 , 6 , 6 , 4	.18	.15	.15	.10	-.14	4 , 1 , 1 , 4
4 , 1 , 2 , 0	.10	.02	.05	0	-.04	6 , 2 , 1 , 4
1 , +1 , 0 , 0	.02	+.02	0	0	0	2 , 2 , 0 , 0
- , - , +1 , -	-	-	+.02	-	+.02	-

Scale of microphotometer tracings

Measures of tracing of MC 21722, δ Canis Majoris, lines identified from enlarged spectrum of δ CMa marked by CHP.

λ	Measure on scale	$\Delta\lambda$	Δm	$\frac{\Delta\lambda}{\Delta m}$	$\frac{\Delta m}{\Delta\lambda}$	Mean A per scale div per A	Mean A per A scale div.	at
4315	0							
26	13.5	11	13.5	1.2	.83	1.26	0.77	4300
31	~~24.5~~ 19.5	5	6.0	1.2	.83	1.16	0.86	4400
40	30	9	10.5	1.3	.78	1.06	0.96	4500
52	44	12	14	1.2	.86	0.96	1.06	4600
58	52.5	6	8.5	1.4	.71	0.86	1.16	4700
75	71	17	18.5	1.1	.93	0.76	1.25	4800
83	81.5	8	10.5	1.3	.77	0.66?	1.35	4900
95	93	12	11.5	1.0	.96			
4400	99	5	6.0	1.2	.86			
4417	117.5	17	18.5	1.1	.93			
4444	146	27	28.5	1.0	.95			
4468	150+0 = 150	24	()					
81	+13 = 163	13	13	1.0	1.00			
88	+21 = 171	7	8	1.1	.90			
4534	+68 = 218	46	47	1.0	.98			
49	+84 = 234	15	16	1.0	.91			
55	+89 = 239	6	5	0.9	1.20			
84	+117 = 267	29	28	1.0	1.05			
4619	+152 = 302	35	35	1.0	1.00			
4629	+161 = 311	10	9	0.9	1.10			
4765	0							
4824	51	59	51	0.8	1.16			
4848	71	24	20	0.8	1.20			
4861	86.5	13	9.5	0.7	1.37			
4922	118	61	57.5	0.5	1.63			

1.5

1.0

.9

.8

.7

.6

.5

4300

4400

4500

4600

4700

4800

4

 $\otimes \leftarrow$ low weightA per
scale
div.Scale div. per
A.

apertured spectra with 11 inch telescope.

Measurement of apertures.

One scale division = $\frac{1}{40}$ inch

aperture	Readings across for width*		Readings along for depth		Width	Depth	Area ($\frac{1}{1600}$ in ²)
1	** { 9.85 8.45	{ 41.85 40.65	{ 20.62 21.53	{ 44.61 45.33	32.00 } 32.10 32.20 }	23.99 } 23.80 23.90 }	767.1
2	{ 10.70 13.80	{ 34.62 37.80	{ 7.50 12.70	{ 29.75 34.90	23.92 } 23.96 24.00 }	22.25 } 22.22 22.20 }	532.5
3	{ 12.15 14.48	{ 36.20 38.50	{ 16.20 19.10	{ 32.15 36.10	24.05 } 24.04 24.02 }	15.95 } 15.98 16.00 }	384.2
4	{ 16.30 21.74	{ 33.15 38.60	{ 20.95 23.80	{ 36.95 39.76	16.85 } 16.86 16.86 }	16.00 } 15.98 15.96 }	269.4
5	{ 22.07 20.60	{ 38.05 36.60	{ 24.42 25.75	{ 36.45 37.77	15.98 } 15.99 16.00 }	12.03 } 12.02 12.02 }	192.2
6	{ 17.43 24.50	{ 28.40 36.50	{ 24.50 24.49	{ 35.70 36.29	10.97 } 11.98 12.00 }	11.20 } 11.50 11.80 }	137.8
7	{ 20.90 21.90	{ 32.90 33.70	{ 26.70 28.30	{ 34.62 36.27	12.00 } 12.00 12.00 }	7.92 } 7.94 7.97 }	95.3
8	{ 23.90 25.75	{ 32.40 34.25	{ 25.35 25.72	{ 33.34 33.70	8.50 } 8.50 8.50 }	7.99 } 7.98 7.98 }	67.8
9	{ 22.70 27.60	{ 30.70 35.55	{ 30.58 32.63	{ 36.50 39.60	8.00 } 7.98 7.95 }	5.92 } 5.94 5.97 }	47.4
10	{ 20.30 24.80	{ 26.30 30.80	{ 25.78 26.55	{ 31.39 32.65	6.00 } 6.00 6.00 }	6.08 } 6.09 6.10 }	33.6
11	{ 26.80 25.90	{ 32.74 31.90	{ 28.10 30.58	{ 32.05 34.50	5.96 } 5.98 6.00 }	3.95 } 3.94 3.92 }	23.6

* width corresponds to slotted edge $\perp$ refracting edge of prism

** For width, upper reading corresponds to edge near number of aperture

For length, upper reading corresponds to edge near right hand angle slot, counting from figure.

1924phae.proj.10999

Measured W inches D	Theoretical W inches D	Log area	Magnitude Difference		Diff.	Diff.
			Diff.	↓		
8.02 5.98	6.00 8.00	2.8849	0.0000	0.0000	-	
5.99 5.55	6.00 5.66	2.7263	0.1586	0.396	.396	} .75
6.01 3.99	6.00 4.00	2.5845	0.3004	0.751	.355	
4.22 3.99	4.24 4.00	2.4305	0.4544	1.136	.385	
3.99 3.01	3.00 4.00	2.2837	0.6012	1.503	.367	} .75
2.99 2.88	3.00 2.83	2.1392	0.7457	1.864	.361	
3.00 1.98	3.00 2.00	1.9790	0.9059	2.265	.401	
2.12 1.99	2.12 2.00	1.8314	1.0535	2.634	.369	
1.99 1.48	1.50 2.00	1.6758	1.2091	3.023	.389	
1.50 1.40	1.50 1.41	1.5264	1.3585	3.396	.363	
1.49 0.98	1.50 1.00	1.3722	1.5127	3.782	.386	

First List of stars to be included in apertured program

Star	R.A.	Dec.	m.	Class	Factor for α Band	Features	ap
α Virginis	13 19.9	-10 38	1.21	B2	$\times 2.5$	Deep H	1,2
α Bootis	14 11.1	+19 44	0.24	K0	1.00	H and K	1,2
α Scorpii	16 23.2	-26 13	1.22	Ma	$\times 2.5$	violet and red ends	1,2
α Herculis	17 10.1	+14 30	3.48+	M6	$\times 20$	" " " "	1,2
α Ophiuchi	17 30.3	+12 38	2.14	A5	$\times 5.5$	Deep H	1,2
α Aquilae	19 45.9	+8 36	0.89	A5	$\times 2.0$	Deep H	1,2
η Aquilae	19 47.4	+0 45	var.	eF8	$\times 6$	Sharp lines	1,2
γ Cygni	20 18.6	+39 56	2.32	eF8	$\times 6$	Sharp lines	1,2
α Cygni	20 38.0	+44 56	1.33	A2	$\times 2.5$	Sharp lines	1,2
β Pegasi	22 58.9	+27 32	2.61	M6	$\times 7.0$	violet & red	1,2
α Cas	0 34.8	+56 0	2.47	K0	$\times 7$	H and K	1,2
γ Cas	0 50.7	+60 10	2.25	B0	$\times 6$	Bright H	1,2
α Ceti	2 14.3	-3 26	var.			Bright H	1,2
α Persei	3 17.1	+49 30	1.90	F5	$\times 4$	Sharp lines	1,2
ϵ Aurigae	4 54.8	+43 41	var.			Sharp lines	1,2
α Aurigae	5 9.3	+45 54	0.21	G0	$\times 1.00$	H and K	1,2
β Orionis	5 9.7	-8 19	0.34	CB8	$\times 1.5$	Sharp lines	1,2
α Orionis	5 49.8	+7 23	0.92	Ma	$\times 2$	violet & red	1,2
η Leonis	10 1.9	+17 15	3.58		$\times 20$	Sharp lines	1,2
α UMa	10 57.6	+62 18	1.95	K0	$\times 4$	H and K	1,2
α Tau	4 30.2	+16 19	1.06	K5	$\times 2$		1,2

Two-prism-program can include stars down to reasonable duration (less than or equal to Stars suitable for such work checked thus ✓
 11 such: 6 of these have been analyzed with 16 inch
 6 doubtful:

apertures	Load	Theoretical Exposure		
1,2,4,6,7	190	30	✓	✓
1,3,5,7,9	30	10	✓	✓
1,2,3,4,5	190	30	✓	✓
1,2,4,5	129	180	x	
1,2,4,6,7	180	60	x	?
1,2,4,6,7	210	25	✓	✓
1,2,3,4,5	130?	180	x	
1,2,3,5,7,9	120	20	x	?
1,2,3,4,5	300	10	✓	✓
1,2,3,4,5	120	20		?
1,3,7,9		60		?
1,2,3,4,5		60		?
1,3,5,7,9	210 at max	60		??
1,2,3,4,5	165	45	?	✓
1,3,5,7,9	130?	30		
1,2,3,4,5	300	10	✓	✓
1,3,5,7,9		5	✓	✓
1,2,3,4,5	210	20	✓	✓
1,2,3,4,5	180	180		
1,2,4,5	165	45		✓
1,2,3,4,5	210	30	✓	✓

second magnitude only, if exposures are to be of 30 minutes)

northern
List of stars brighter than the third magnitude.

			^{RA}	^{Dec}	Seas.
✓ α And	A0	2.15	0 3.2	+28 33	
β And	Ma	2.37	1 4.1	+35 5	
✓ α Aql	A5	0.89	19 45.9	+8 36	
γ Aql	K2	2.80	19 41.5	+10 22	
α Ari	K2	2.23	2 1.5	+23 0	
β Ari	A5	2.72	1 49.1	+20 19	
✓ α Aur	G0	0.21	5 9.3	+45 54	
β Aur	A0p	2.07	5 52.2	+44 57	
✓ α Boo	K0	0.24	14 11.1	+19 44	
✓ α CMa	A0	-1.58	6 40.7	-16 34	
✓ β CMa	B1	1.99	6 18.3	-17 55	
✓ δ CMa	F8p	1.98	7 4.3	-26 14	
✓ ε CMa	B1	1.63	6 54.7	-28 50	
η CMa	B5p	2.43	7 20.2	-29 7	
✓ α CMi	F5	0.48	7 34.1	+5 30	
✓ α Cas	K0	2.47	0 34.8	+56 0	
✓ β Cas	F5	2.42	0 3.8	+58 36	
✓ γ Cas	Bp	2.25	0 50.7	+60 10	
δ Cas	A5	2.80	1 19.2	+59 43	
✓ α Cep	A5	2.60	21 16.2	+62 10	
α Cet	Ma	2.82	1 57.1	+3 42	
✓ β Cet	K0	2.24	0 38.5	-18 32	
α CrB	A0	2.31	15 30.4	+27 3	
✓ α Cyg	A2	1.33	20 38.0	+44 56	
✓ γ Cyg	F8p	2.32	20 18.6	+39 56	
δ Cyg	A0	2.97	19 41.9	+44 53	
✓ ε Cyg	K0	2.64	20 42.1	+33 36	
✓ β Gem	K0	1.21	7 39.2	+28 16	
✓ γ Gem	A0	1.93	6 31.9	+16 29	
β Her	K0	2.81	16 26.0	+21 42	
✓ δ Cep			22 25.4	+57 54	

24 are brighter than 2nd and suitable for 2 prism work with 11 inch
 All are suitable for 1 prism work for 11 inch

53

		RA	Dec	Seas.
✓	α Hydrae K2 2.16	9	22.6 -8	13
✓	α Leo B8 1.34	10	3.1 +12	28
	β Leo A2 2.23	10	44.0 +15	8
✓	α Lyr A0 0.14	18	33.6 +38	41
	α Ph A5 2.14	17	30.3 +12	38
	β Ph K0 2.94	17	38.5 +4	36
	γ Ph B0 2.70	16	31.7 -10	22
✓	α Ori Ma 0.92	5	49.8 +7	23
✓	β Ori B8p 0.34	5	9.7 -8	19
✓	γ Ori B2 1.70	5	19.7 +6	16
✓	ε Ori B0 1.75	5	31.2 -1	16
	ι Ori Oe5 2.87	5	30.5 -5	59
	κ Ori B0 2.20	5	43.0 -9	42
✓	α Peg A0 2.57	22	59.8 +14	40
✓	β Peg B1 2.61	22	58.9 +27	32
✓	γ Peg B2 2.87	0	8.1 +14	38
✓	ε Peg K0 2.54	21	39.2 +9	25
✓	α Per F5 1.90	3	17.1 +49	30
	ε Per B0 2.96	3	51.1 +39	43
	ζ Per B1 2.91	3	47.8 +31	35
✓	α Sco Ma 1.22	16	23.2 -26	13
	δ Sco B0 2.54	15	54.4 -22	20
✓	α Tau K5 1.06	4	30.2 +16	19
✓	β Tau B8 1.78	5	20.0 +28	32
	η Tau B5 2.96	3	41.6 +23	48
✓	α UMa K0 1.95	10	57.6 +62	18
	β A0 2.44	10	55.9 +56	55
	γ A0 2.84	11	48.6 +54	14
✓	ζ Ap 1.68	12	49.6 +56	30
✓	α UMi F8 2.12	1	22.0 +88	46
✓	β " K5 2.44	14	51.0 +74	34
✓	α Vir B2 1.21	13	10.9 -10	38

List of MC apertured spectra

sp. class.

for determination of changes in load

for change of magnitude

MC	Star	Load <i>exp.</i>	Good ^{1st} spec.	Bright or faint	m
20794	γ Cas		-	too ft.	2.25
21638	γ Cas	225, 20	1	f ft	2.25
21789	ϵ Ori	150, 20	1	-	1.75
	ζ Ori	150, 20	1	-	2.05
21787	δ Ori	130, 30	1	ft	2.48
21788	β Ori	300, 10	1	ft	0.34
20799	α Lyr		-	too ft.	0.14
20790	α Lyr	500, 12	1	-	0.14
20799	α Lyr		1	ft.	0.14
21642	α Cma	(800) 400, 5	2	-	-1.56
21647	" "	(800) 400, 5	2	-	"
21648	" "	400, 5	1?	ft.	"
21801	" "	800,	2?	ft.	"
21802	" "	800,	1?	ft.	"
20803	" "	800	1?	ft.	"
21640	α Cyg	212, 20	1	-	1.33
20842	α Cyg		1	-	1.33
21644	α Cyg	210, 20	1	-	1.33
20800	α Aql	200, 20	1	-	0.89
21645	δ Cas	200, 20	1	ft.	2.80
20793	α Aql		1	ft	0.89
20796	α Aql		1	-	0.89
21720	δ Cas		1	ft	2.80
21756	α Cmi	180, 15	1	ft	0.48
21743	α Per	135, 30	1	ft	1.90
21722	δ Cma	120, 30	1	-	1.98
21721	α Aur	(550) 225, 20	2	-	0.21
20797	α Bor	300, 15	1	ft	0.24
20795	" "		1	ft.	"
20791	α Boo		1?	Good	"
21646	α Cas	120, 40	1	Br	2.47
21041	α Ori		1	off	0.92

On this scale, roughly
m load

-1 750

0 420

+1 190

+2 130

+3 120

630

300

70

10

