

KG
11365
685

Leah B Allen

η Centauri

V.S. in field $14^h 12^m - 35^\circ$

KQ 11365.685

Study of η Centauri

Leah B. Allen
Wellesley

KG 11365.685

Abbreviations used

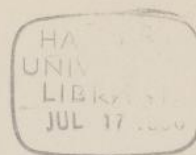
ab = absorption line

em = emission line

v = violet

Similar means having same combination of ab and em, but implies nothing as to intensities

alike means apparently identical



1911

Dec. 15

1

Plate No.	First inspection of plates to ^{classify} choose one for comparison
x8493	H β sharp absorption, possibly a narrow bright component toward V. <u>good line</u>
10276	Sharp emission, possibly superposed on faint ab. em. nearer red edge of ab.
~~10273~~	
10273	Similar to 10276
9911	ab narrow superposed on em & near V. edge
9861 (lowest spectrum)	H β ab; spectrum faint
9666	H β almost absent; faint em on ab
9619	narrow ab on em on faint, broad ab
9609	narrow faint em on broad, almost invisible ab.
9602	Faint ab toward red, narrow em, narrow ab, faint em
9583	ab on em on ab <u>good lines</u>
9576	Similar to 9583
9548	"
9539	"
9531	ab on em, possibly on ab. cf. 9619
9527	Similar to 9583; em ^{more easily seen} ~~clearer~~ toward red of ab than toward V.
9523	^{similar to} 9619 with broad ab doubtful
9519	1 similar to 9619
5759	em on ab; ab more conspicuous than em
9495	Faint; ab on em on ab; 9619
9499	Similar to 9619, broad ab almost invisible
9505	H β almost invisible; possible em on ab
9510	Similar to 9619
9515	Similar to 9523
9162	Similar to 9495
9207	Similar to 9619
9224	Similar to 9609

Dec. 15

Plate No.

- 9280 H β ab on em cf. 9911 -
- 9290 ab on em, possible faint ab toward ^{cf. 9911} V of em
- 9312 ab on em cf. 9911
- 9141 ab, em, ab, each joining the other but not
conspicuously superposed cf. 9499
- 9053 H β ~~em on ab~~, almost invisible, em on ab
- 9052 Similar to 9053
- 7508 intense ab line cf. 8493
- 8505 ab sharp, em doubtful cf. 9911 & 8493
- 10871 Ab on em, whole H β almost invisible
- 10754 Ab on em on ab, 9619
- 10740 Similar to 9619
- 10737 "
- 10729 "
- 10676 } alike narrow ab on conspicuous em. cf. 9531
- 10672 } Similar to 9619
- 10605 } nearly alike Em on ab, similar to 10273
- 10600 } - Em conspicuous, narrow ab toward red,
narrow faint em beyond red of ab; possible
faint ab beyond both on each side.
cf. 9527 for contrast
- 10594 Em on ab similar to 10273
- 10559 Ab on em; em more conspicuous than ab
^{similar to}
cf. 10676
- 10555 } nearly alike Ab on em similar to 9523, 9619
- 10554 }
- 10549 Similar to 9619
- 10547 cf. 9619 em on faint ab; possibly em has
faint em component toward red
- 10543 Similar to 10273 cf. 10547
- Ab on em similar to 10600

Dec. 15

3

Plate no.

10540	H β	similar to 10600
10535		similar 10600
10528		Em on ab, poor spectrum
10524		ab on Em on faint ab 9619
10329		Similar to 10273
10328		" 10273
10327		" 10273
10326		Between 10273 and 10600
10325		Similar 10273
10324		" 10273 cf 10326
10321		" 10273
10318		" 10326
10315		" 10273
10313		" 10326
10307		Between 10273 & 10600
10304	} alike	Similar to 10273, more intense
10301		" 10273 " "
10298		" 10273
10295		" 10273
10292		" 10273

1912 Jan. 8

Plate No.

8493	H β narrow, distinct ab
9583	Double em (I am uncertain whether the division between the lines is ^{superposed} or not)
9619	Similar to 9583; division a trifle more like an ab; a slight indication of an ab on each side of em.
9523	Similar to 9583
10600	Em conspicuous; double, wider component toward violet
10676	Similar to 10600
10326	Em; ~~or~~ narrow, faint em component toward red
10276	Similar to 10326, but whole spectrum fainter.

Examination of wide, hazy ab	
10326	Apparently - in width to ~~Hβ~~ H γ in 10276
10276	" " " " " 10326
10676	" " " " " , but more distinct
10600	" " " " " 10276
9523	" " " " " 10276
9619	" " " " " 9523
9583	" " " " " "
8493	Doubtful

Comparison of central ab in
relation to background (bg)

8493 } conspicuous

8505 }

7508 fainter than 8505 & broader; Conspicuous

9619 more intense than background

9583 possibly more intense than bg.; difference less
than in 9619

9523 like 9583

10600 Difference doubtful on account of em

10676 Probably no dif

10326 No difference; (em of greater wave length,
narrow & inconspicuous)

~~10276~~

10276 No difference (red em more inconspicuous
than in 10326)

Jan. 15

Comparison with each other of similar plates

Plate no.

9523

= 9619

"

less intense than 9619

9619

em narrower toward V than in 9583

9515

V-em < 9619 ; = 9619 < 9619 < 9619

9523

seems to have change of vel. of source of
ab in relation to em during exposureProbably due to film & 9523 belongs with
9583

9510

= 9619

V-em > 9619

9548

= 9523

9576

< 9583

9539

em less intense than in 9583; ab narrower

9531

= 9619

~~9619~~

9527

= 9619 of 9539

9162

similar to 9539

9499

similar to almost equal to 9583; lines
narrower in 9499 & ab toward R of center of em

9495

similar to 9539

10 747?

similar to 9583, perhaps fainter

10 754

= 9583

9519

Similar to 9583; lines finer, that is, narrower than ⁹⁵⁸³
1

Plate No.

8505

~~8493~~

ab conspicuous; em on red side of it

8505

7508

ab broad & not sharply defined; em hardly visible

8493

ab conspicuous; em on v. side

10737 (comparison)

9523

between 10737 and 9583

10729

similar to 10737; lines sharper than in 10737

9495

between 9583 and 7508; lines

9162

Hardly any line visible

9539

= 9495; possibly 9539 has sharper lines

~~9519~~

9505

less visible than in 9162

Plate No

J.D

10754

16337

9519

4800

90 | 11537

± 7.07

9162

4437

9505

4797

90 | 360

4

Jan. 22

- 10600 em more conspicuous than ab; ab
toward red; em beyond ab, very narrow
- 10535 = 10600
- 10540 Em toward red wider than in 10600
- 10307 ^{central} No ab; em V intense; em toward R. about
the same as in 10600
- 10676 ^{central} No ab; em toward red nearly as wide as
toward V.
- 10543 = 10600
- 10543 = 10535

9911 = 9619 ab prominent; solar lines compar-
uons

9290 similar to 9619
~~9288~~ " " "

10672 = 10676 or ^{em} ~~H β~~ more intense than in 10676

- 10871 similar to hardly any line visible of 10737
- 10729 similar to 10737 of these two plates in
deciding whether center is always an absorption
line or sometimes space between, em
similar to ~~10676~~ ¹⁰⁶⁷⁶, but em fainter than in ~~10676~~ ¹⁰⁶⁷⁶
- 10740 " " 10676; em sharper than in 10676
- 10559 " " 10676; em sharper than in 10676
- 9312 almost = 8493

Jan. 22

10547 similar to 10600; not quite so intense as in 10600

9602 similar to 9583

10326 (comparison)

10324 = 10326

10325 = 10326 except for a few fine ab. lines which show in 10325 not in 10324 or 10326 (polar)

10328 similar to 10326, but ab. more apparent

10329 = 10326

10315 almost = 10326

10318 = 10326

10321 similar to 10326, perhaps fainter than 10326

10310 = 10326

10304 similar to 10326; H α -V more intense, H α -R narrower than in 1032610327 almost = 10326; H α -R less noticeable than in 10326~~10327 H α -R less than in 10304 (wrong plate)~~

10327 = 10304

~~9162~~

10871 similar to 9162

9207 similar to 9619, but fainter; cf 10871

9052 similar to 9619

9053 " 10871

9224 " 9052

Jan. 22

10276 (Comparison)

10282 almost equals 10276, em- α less than 1028210288 $\approx$ 1027610289 $\approx$ 10282

5759 similar 8493

10301 similar to 10276, almost equal, whole spectrum more intense

10292 similar to 10276, wider

10285 almost equal to 10276, more intense throughout spectrum

10285 almost equal 10285, em- α more noticeable in 10285

10298 similar to 10276, wider

10273 perhaps equals 10276

Feb. 2

Comparison of lines with marked lines
on plate C 6563 α Bootis

ab = central absorption line

em = emission line

p = position of center of a with reference
to center of e. + = toward red from center

W = width of e toward red in comp with e toward V.

Plate No.	ab	em	p	W
8493	>1 <2	>3 <4		.5

This method of Cf. does not seem
practicable because in 9619, H β ab is quite
different character from 8493, yet owing to
the exposure of the whole spectrum, it comes
between the same marked lines of α Bootis that
8493 does.

I shall try comparing the components
of H β with standards chosen from η plates
and estimate the relative intensity of the line
against its own background; i.e., against
the faint, broad absorption line which
seems to be present in all the plates & of
practically equal intensity. I shall call
ab in 8493 10 and em in 10276, 10.

Feb. 2

For explanation, see previous page
 W' = width of ab compared with V -em

Plate	ab	em	W	W'	Similar to
8493	10	1	.5		
9619	5	3	1.3	1	
9583	5	4	1.		
10737	0	4	1		
10600	2	4	.3		
10676	12	4	.8		
10326	0	10	.1		
10276	0	10	.1		
9861	2	3	1.5		
7508	7		1.3	wrong plate	
7508	10	0			
8505	10	1	2.		8493
5759	7	1	1.	2	
9312	5	2	.7	1	
9495	1	1	.5	.7	10737
9207	0	1	1	1	
9224	1	.5	1	2	9207
9053	1	< 9224	.5	2	
9052	Poor plate				9053

Feb. 10

Feb. 10.

Continuation of previous estimates
 Plate similar is used for comparison in making estimate

Plate	ab	em	W	W'	Similar to
8493	10	1	.5	$V < ab$	
10276	0	10	.1	$ab < V$	
9619	2	3	1.5	2	
9583	3, 4	2	1.1	2	
9619	ab > 9583				
9141	5	2	1	2	9583, 9619
0	An attempt will be made to estimate ab and em by Angeland's grades				
9280	$2 > 9141$	$2 < 9141$	2	1.5	
9290	~~2~~ $3 < 9141$	$4 > 9141$	1	2	
9290		$3, 4 > 9280$			
9499	> 9583 ; = 9583	$3 = 9583$	1	1.5	9583
9510		$3 > 9583$	1.5	1.5	confused plate numbers
9510	$2 > 9583$	$3 < 9583$	1.5	1.5	
9515	= 9583	= 9583	1.5	2	
9519	= 9583	$3 < 9583$	1	2	
9527	$3 > 9141$	= 9583	1.1	1.5	
9531	= ~~9583~~ ⁹⁶¹⁹	= ~~9583~~ ⁹⁶¹⁹	2	1.5	mistake in reading no. of plate
9539	$2 < 9583$	1. $4 < 9583$	1	1	
9548	$3 > 9583$	$3 < 9583$	1	1	
9576	$3 < 9583$	= 9583	1	1	
9911	= 9583	$3 > 9583$	2	2	
9911	> 9619	> 9619			
10528	0	0			Poor plate
10554	= 9583	= 10276	.3, .5	1	
10555					= 10554
10754	$3 < 9141$	$3 > 9141$	1	1	
10754	= 9619	$3 > 9619$			

Feb. 12inequality sign
means intensity

Plate	ab	~~#~~ cm	W	W'	Similar to
9666	=10276	=8493	.5	1	
4156	3 > 9666	=8493	Poor plate, small disp.		9583 perhaps
9162	=9583	3 < 9583	1	2 or 1.5	very hazy
9162	more like 9666 than like 9583				
9162	2	2 < 8493			
9162	3 > 9666	3 > 9666			
9505	0	3 < 9666	1	1.5	
59666		2 < 8493			
9523	=9583	3 < 9583	1	1	
10871	much < 9583	perhaps = 9583	1	1	
10871	0	3, 4 < 10276 < R 10600	1	1.5	
10871	< 9162	2 > 9162			
10729	~~+ > 10~~ 0	1 > 10737	1	1.5	Change not in estimate; wrong column
10672	= 9141 ?	~~9141~~	8	1.2	
10672	3 < 9141	10676 ~~/~~	1	1	10676
10559	3 > 9583	R = R ₁₀₆₇₂ ~~/~~ V 10672 1 > 10276	1	1	
10740	2 < 9583	2 > 9583	1	1	
10540	= 9583	V 2 < 10276	.5	R ≤ 9583 V 8493	.7
10524	3 > 9583	V 2 < 10276	.7	R < 9583	1
10543	3 < 9583	V 3 > 9583	1, .5	R = 8493 ~~V~~ R	1
10547	0			but weaker than R 8493 2 < R 10543	more hazy & fainter than 10535
10547	2 > 10871	V = 9583		R = R 10543	1.5
10549	= 9583	V = 10600 perhaps	.5	R 1 < 9583	1
10535	= 10549	V 2 < 10549		= 10549	10549
10594	= 10535	V 3 < 10535	.5	R = 10535	.8
10600	probably equal to 10535, but less dense spectrum				
10605	"	"	"	"	much denser
9609	= 9666	3 > 9666	1	R = V	2

Feb. 12

Plate	Qr	V-ern	W	R-ern	W'	
10282	0	2 < 10276	.1	2 < 10276	.7	
10288	0	11 > 10276	.1	3 < 10276	.7	Plate denser than 10276
10289	0	= 10276		3 > 10288		10276
10298	0	3 > 10288		= 10288		10288
10295	0	2 ³ < 10298		2 < 10298		
10285	0	= 10276		= 10276		
10292	0	4 < 10282		= 10282		10282
10292		twice as broad but = 9583				
10301	0	= 10298				

Feb. 19

Plate 10301	ab	V-ein	W	R-ein	W'	Similar to
10301	0	= 10298	2	= 10298	.5	10298
10304	0	= 10301	$\frac{1}{2}$	= 10301	.5	10301
10307	0	2 < 10301	5	3 > 10301	.5	
10310		= 10307		= 10301		10301
10310		= 10301				
10313		= 10298	.2		.5	
10321		= 10313	poor plate			10313
10315		= 10313		= 10313		10313
10318		= 10313		= 10313		
10324		1 < 10313		= 10313		
10325		1 > 10313		1 < 10313		
10324	fainter plate than 10325					
10327 ₄		= 10325		= 10325		
10325	= 10276 in every respect					
10328	poor plate					
10329		= 10313		= 10313		10276
10313	= 10276					
10273	= 10276, more intense plate					
9602	= 9619	3 < 9495, = 8493	2.	= R in 10600	1.	
9602		~~R-ein = ab~~		1 < 9583; R-ein = ab		
10754						

Feb. 19

Estimation of comparison plates

Plate	ab int.	Width	V-em	W	R-em	W'
-------	------------	-------	------	---	------	----

8493

10

ab int. = intensity in terms of 8493 = 10
 ab width = width of ab in terms of 8493 = 1
 $V-em \ 10276 = 10$ for intensity, 1 for width
 $R-em \ 10276 = 10$ for intensity, 2 for width

$V-em \ 10276 = 10$, int.; 1 width,
 used as comp. for
 both V & R em

Plate	ab int.	Width	V-em Int.	Width	R-em Int.	Width	V, S, E
-------	---------	-------	-----------	-------	-----------	-------	---------

8493

10

1

1

.3

1

.1

Hazy, possibly double

9141	5	.8	3	.7	3	.6	8493
------	---	----	---	----	---	----	------

9583	7	1	3	.7	3	.7	Hazy
------	---	---	---	----	---	----	------

~~9583~~

9619	5	.6	1	.5	1	.5	Broad, 8493
------	---	----	---	----	---	----	-------------

10600	4	.6	5	.8	1	.5	Sharper than 8493
-------	---	----	---	----	---	----	-------------------

9666	0	.6	1	.1	1	.1	Broad, hazy = 8493
------	---	----	---	----	---	----	--------------------

10737	0	1	1	1	1	1	Sharper than 8493
-------	---	---	---	---	---	---	-------------------

9162	2	1	1	.5	1	.5	Sharper than 8493
------	---	---	---	----	---	----	-------------------

10676	3	.5	10	.7	6	.5	narrow, V, E, R
-------	---	----	----	----	---	----	-----------------

10326	0	.3	10	1.3	3	.2	8493 at sharp
-------	---	----	----	-----	---	----	---------------

10326							< 8493, toward
-------	--	--	--	--	--	--	----------------

9162 ab = 10676							flight
-----------------	--	--	--	--	--	--	--------

10276	0	.3	10	1	1	.1	E & S double?
-------	---	----	----	---	---	----	---------------

10276							narrow
-------	--	--	--	--	--	--	--------

Solar lines by λ of 7990 Å approx

intensity of solar lines

$H\gamma - H\delta$	$H\delta - H\gamma$	$H\gamma - H\beta$	
K not present; ~~2 broad bands~~ 1	3 bands helium	23 solar lines faint 4385, 4417, 4598 4619, 4629 1 Helium	1
2 Helium lines	3 Helium		
As in 849 3	~~8 solar~~		1
~~8 solar~~	As in 849 3		> 8493
~~9141~~			
	55 solar	18 solar	1
Helium lines present	No solar lines		
"	6 solar	18 solar	1
"	Solar lines doubtful, possibly a few between $\lambda/3$		
γ hazy, 2m V & R	8 solar lines	18 solar	1
	No solar lines		
	No solar lines		
	No solar		
	} probably		

Feb. 26

	em	ab	em	Similar
9495				
	seems possibly fainter in all, but this, but plate fainter, so probably = 9280			
9510				9280
10729	em 3 < 9510	ab much fainter		
10535	em > 10543	ab > 10543	10355	more intense, the same plate
10594	= 10543			
10605	em = ¹⁰⁵⁴³ 10535	ab < ¹⁰⁵⁴³ 10535		
10672	em much more intense than 10605; ab > 10605			
10600	= 10535 in em & ab			
10672	probably > in all ways 10676; but ~~fainter~~ darker plate			
10276	em easily more intense than 10676			
10276	may be more intense than 10273, but as whole spectrum is more intense, dif. is ^{very} doubtful			
10676	em 3 > 10535			
10676	= 10273!			
10276	easily more intense than 10676			
10273	more intense than 10676 3 > or more			

Solar lines
no solar

no solar

no solar

no solar

no solar lines

Mar. 4

To compare scale in ab

- 9194 Broken slide H β , plate overexposed, no line in that region - all lines broad & hazy, Solar lines visible.
- 12949 Apparently same phase as 10600; Kern & ab both distinct; R - even fainter than V, about $\frac{2}{3}$ as wide as V. V - even = in width ab.
- But 12949 H γ all wider than 10600, altho dispersion of 10949 is less
- 9495 } Dif. may be due to exp.; 9495 hazier
9499 } through, but dif. most marked in β
Both Solar lines
- 9548 Something like 9495, but not same phase, 9495, V - even wider than R 9548, Solar
9548, R than > V.
- 10547 ab 1 > 9495; lines sharp; no solar
- 9224 = 9495 through
- 9053 = 9495, but denser & harder to see
- 4156 ab = b? and?
- 9861 = 9495
- 10676 3 > 9495, ab
- 10600 probably may = 10676 thru-out; much fainter plate
- 9911 3 > 10676 Solar lines
- 9290 = 9911 thru-out
- 9280 = 9290
- 9548 = 9290
- 9911 = 9290 thru-out
- 8505 ^{ab} much more intense than 9290 Solar lines less than in 9290
- 8493 = 8505

Mar. 4

27

7508 shows only one broad, ab, a broad, intense line; no em; but plate burned out in that part

10547 = 10543

10528 lines all hazy, $H\beta$ as in poor plate

10524 like 10535 except $H\beta$; em, ab, em all more intense than in 10535

10559 = 10524

8493 ab 3 > 10559

10559 3 > ~~10525~~ 9911

10676 > 10535

10535 = 9495

9583 has ab toward V. of broad ab. not observed till read in H. A. p. 182. Is it a part of $H\beta$?

9583 ab 2 > 9619

9583 2 > 10559

9619 = 10559

9619 = 9911

~~9911~~ = 10559

10600 = 2 > 10676

9911 = 2 > 10600

8493 = 3 > 9583

10600 = 10559

Mar. 4
Mar. 12

Behind phases alive

8493 2162 ⁹¹⁶²~~9583~~ ~~96~~ ⁹⁵⁸³~~9619~~ ⁹⁶⁶⁶~~10737~~ 10737 10600

9141

10676

10326

~~10676~~

~~10326~~

10 273

Mar. 12

Plate	8	9 8	em	he	ab	em	em	ab
10326	20	4295 } 4142 399 }	33 864 } 801 138 }	40.2275 } 278 2280 }	55 4665 } 4442 } 454 575 } 453 }			
10273	20	300 } 314 328 }	33 781 } 788 796 }	40 102 } 109 116 }	55 311 } 298 284 }	55 401 } 390 380 }		
9141	31	504 } 494 } 498 491 }	44 977 } 985 993 }	51 272 } 262 251 }	66 458 } 469 479 }	66 579 } 486 593 }		
9583	25	3645 } 382 399 }	38 866 } 887 907 }	45 208 } 207 209 }	60 361 } 372 382 }	494 } 495 496 }		
9619	39	4585 448 25 897 } 902 908 }	762 } 453 762 }	45 762 } 758 755 }	60 942 } 942 942 }	61 553 } 047 523 } 841 }		
8493	25	404 } 418 433 }	38 910 } 911 912 }	45 235 } 221 2075 }	60 420 } 475 501 } 505 }	467 }		

V-em - Y

ab - Y

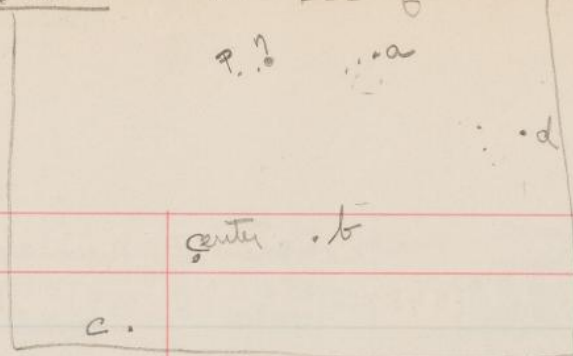
10326	21.653	21.602
10273	21.510	21.402 602
9141	21.484	.508 .501
9583	21.485	.594 .608
9619	21.491	.594
8493		.564

em	he	he-R-em;	R-em-ab; ab-V-em; V-em-he; he-V	V- δ
57 $\begin{smallmatrix} 571 \\ 526 \end{smallmatrix}$ } 548			15.176	6.477 13.387
			0.092 15.189	6.321 13.474
57 $\begin{smallmatrix} 392 \\ 373 \end{smallmatrix}$ } 382				
66 $\begin{smallmatrix} 723 \\ 721 \\ 708 \end{smallmatrix}$ } 717	68 $\begin{smallmatrix} 644 \\ 600 \end{smallmatrix}$ } 622	1.905 ~~1.805~~	0.231 0.017 15.207	6.277 13.487
567 } 568	02 $\begin{smallmatrix} 546 \\ 559 \end{smallmatrix}$ } 553	1.984	0.073 0.123 15.165	6.320 13.505
134 } 132	63 $\begin{smallmatrix} 049 \\ 055 \end{smallmatrix}$ } 052	1.920	0.085 0.105 15.184	6.305 13.451
623 } 620	62 $\begin{smallmatrix} 626 \\ 580 \end{smallmatrix}$ } 603	1.983	0.145 15.254	6.310 13.493

32

Mar. 25To see if the light of η variesB series
Class 2

RA. 14 30, -43.5



Plate

12863

$C = 2 > b$

$a = \text{more than } 3 > b$

$P = \text{more } 3 < a$

15398

$C = 2 > b$

$d = 2 > c$

$P = 2 < d$

20115

$c = 2 > b$

$c = d$

$d = 2 > b$

$P = d$

~~30286~~

31675

$c = d$

$c = 2 > b$

$d = 2 > b$

$P = b$

35642

$c = 2 > b$

$d = 1^2 > b$

$d = 1 < c$

$P = c$

$$p=d, =c, 2>b$$

$$2>b =c; \text{ more than } 3<a$$

$$=c =2>b = \text{more than } 3<a$$

$$p=3<d$$

$$p=1<b$$

$$p=1>d$$

$$p=2>b$$

$$p= \text{more than } 3<a$$

Mar. 25

 η

.a

.b

Class S; Series a M

7168

 $b > a$ $\eta 2 > b$

7138

 $\eta 2 > b$

7093

 $\eta 2 > b$

6118

 $\eta 2 > b$

6169

 $\eta 2 > b$

6226

 $\eta 2 > b$

Mar. 30

To compare plates which may be alike

- 4156 H β faint, more ab than em; poor plate ^{1 prism}
- 5759 like 9583, but 1 prism
- 7508 H β faint and hazy; no em; no solar
- 9053 H β very faint; V-em wider than R-em
em and ab about equal in intensity
Other H lines hazy; Solar lines
possibly visible; ^{very faint} but doubtful; poor plate
- 9141 Similar to 9583; but Solar lines fainter &
H β fainter V-em & R-em about equal in width
- 9053 Similar to 9141; H β & Solar lines may be fainter
- 9162 Much like 9141; all lines hazier than in
9141; Solar lines fainter; H β hazier; V-em &
R-em about equal
- 9207 H β , V-em = R-em in width; no brighter than
continuous spectrum; ab no brighter than
broad ab always present; Solar lines easily seen
Solar lines show more than in 9162; but H β
fainter.
- 9162 It is difficult to tell whether ab or em
is stronger; it may be that em is more intense
than in 9207 and so ab looks stronger too by
contrast with em; the em is more intense than
the continuous spectrum, about 2 grades;
The ab also seems about 2 grades stronger
than the broad ab. It is not the same
phase as 9141, tho not far from it

9224 Similar to 9583; Solar lines present
 H β brighter than in 9583
 H β brighter than in 9141

10737 Unlike any on p 36; H β more em than
 ab; em broader than in 9583; ab no
 more intense than broad H β ; whole line faint

10754 No solar lines; other H lines narrow
~~1054~~ Like 10600 H lines narrow; H γ has
 bright edges H β has more em than ab
 but ab easily visible brighter than broad
 H β ; in 10554 V-em about = R-em
 R-em a trifle narrower

10600 R-em seems fainter than V-em

10740 Similar to 10754, but H β fainter, tho
 not like 10737; ab more intense than in
 10737

10871 H lines narrower than in 9162; no solar
 lines; H β fainter than in 9162; ab & em
 about equal, but hardly visible

H γ narrower than in 9053; no solar lines; H β
 fainter than in 9053; other lines like 9053

9052 Poor plate, but more like 9053 than 10871

Mar. 30

9280 Similar to 9583

9290 = 9280

9499 = 9619 2 lines between H α & H γ toward
 vi from H γ ; look like double reversals
 matched in λ 4930
 Not present in 8493 or 10273
 Very faintly visible in 8505, 98493

9505 Similar to 9207; but solar lines & H β fainter than in 9207.

9510 Similar to 9499, but whole plate fainter, perhaps due to difference in exposure

9515 Similar to 9505, but H β not so faint

About = 9207

Similar to 9619

9519

9523

9527

9531

9539

3 solar lines and H β fainter than in 9531
 Seems like 9141; solar lines similar; H β fainter than in 9141

Seems to be intermediate 9141 and 9162

9548

fainter than 9510 = 9510

9576

= 9548

9602

(Similar to 9576; but H β fainter, solar lines a
 little fainter and H lines a little brighter than
 in 9576) = 9576, but less exposed

9609

similar to 9602

9495 probably = 9499

$\left. \begin{array}{l} 10325 \\ 10326 \\ 10327 \end{array} \right\}$ probably equal
 325 and 327 do not show the R-em,
 but 326 is a ^{denser} ~~dark~~ plate & does show it

10292 similar to 10325, H β hazier than in 10325
 10295 = 10292 H β maybe hazier

10554 more ab than in 10326 in H β & solar lines
 are visible, tho very faint

10535 maybe fainter in H β than 10554, but
 they are similar; solar lines more different

10524 = 10554 ^{much}

10528 lines all hazier than 10524; H β hardly
 visible; seems similar to 10871; poor plate

10540 } ~~seem~~ alike, but exposures different
 10543

10540 = 10524

10549 = 10547 10547 much fainter exposures, hard to
 compare

10554 = 10555

10555 = 10549

10559 = 10555 H γ brighter toward Vi

10594 less em at H γ than in 10555 & H β fainter both
 in em & ab

10600 similar to 10594 exposures different

Mar. 30

10605

looks fainter in HB than 10594; but
 whole spectrum is fainter due to ^{apparently} exposure.
 Otherwise 10605 = 10594

10672

~~seems like~~ probably like 10594; but
 much denser, so doesn't look the same

12949

= 10672 as far as can be seen; poor plate

Apr. 22

4156	1 prism	and poor following Solar lines could
5759	1 prism	doubtful whether solar lines
7508	2 prism	Hydrogen lines possibly hazier dense section over part of spectrum; perhaps
8505	H lines	& Solar lines about like 9583
9583	}	H lines hazy; perhaps narrow companion
9519		
9539	H-triple	hazier than 9519; β ^{slightly} fainter; Solar
9583		solar lines more distinct than ¹ in 8505
α Arae		width of broad $H\beta$ ^{Hβ} = same in 9583; em
7990		ab very narrow; H γ similar to H β in 9162
S Centauri		H β bright on broad $H\alpha$ which = in width $H\alpha$ in
8332		more intense & not crossed by any $\alpha\beta$; sharper y bright, less than β in intensity; whole line $\alpha\beta$ & em is displaced from center toward vi.
9548		Sharp narrow $\alpha\beta$ seems to be superposed on
9576	9583	
9602	9583	
9499	9583	
9495	9583	
9609	9583 in H & S,	but whole plate H β much fainter; underexposed
9510		
9515	9583	
9505	H lines	hazier than 9515; lines fainter; H β & helium
9224		Similar to 9583, H β and much less dense
9861	9861	Whole plate faint; apparently like 9583

not show if present ^{known} H β faint & ab; rather than sun
 would show if present H β may resemble 9583
 than in 9583; no solar; slight V-em; distinct ab; plate has
 badly developed; all lines hazier than in 8505

to red β ab central solar lines distinct

= 9583

in H β much more intense, but same width as 9583; central
 other H lines all hazier than in 9583

10326; sun same width as whole sun in 10326; γ much
 toward vi.

same width as γ in 10326; but in 10326, γ is mostly
 also in β other lines hazy, perhaps double
 broader in H lines; like 9583; solar lines like 9583

the helium line beyond H β also faint; region seems

line next beyond, much fainter; densities of plates seem equal

Apr. 22

9548

9911

like 9583, It is doubtful whether H lines
 ab with faint hazy ab companion toward red
 central ab of HB May be near V edge of
 like 9583

9911

Comparing 9911 with 10326, ^{in 10326} the central
 R-em is much fainter, doubtful if narrower,
 Poor plate, spectrum land too narrow

9312

12468

Nothing on this plate

10276

No solar, γ brighter toward V; δ ditto;

10326

like 10276

10672

ab H lines seem sharper than in 10326
 more prominent than in 10326 Central ab near
 fainter throughout than 10672; otherwise
 like 10672

10594

10754

12949

spectrum too narrow, γ less dip (2 pm)

10535

like 10672 except that R-em in HB seems

10600

10594, 10672

10605

10672

10737

probably like 10672; whole spectrum fainter

10871

H lines all hazy; no solar. HB hardly
 narrower than in 9505; not the same condition

10524

Like 10672 except in R-em of HB. At that ^{place} point

10528

very narrow spectrum; Resembles 10871

9539

= 9911, em in HB fainter, probably due to plate

9141

9911

9052

Poor plate

9053

9911

9162

H lines a trifle hazier than 9911; Solar lines

Helium beyond HB fainter than 9911; no such

are narrow as superposed on broad or narrow
em

It can't be determined
ab in HB does not seem displaced, only fainter; the
the vi-em is wider & brighter than in 9911.
Seems more like 8505 than 9911

& narrower than in 9911
of has em toward R as well as toward Vi; R-em

R edge than Vi.
like it
but like 10672

fainter; but difference doubtful

& of greenish tint
visible; ab nearer vi than R more em than in 9505; 198

as 10672
spectrum is faint

as far as can be seen; but HB even fainter than ¹⁰⁸⁷¹

fainter; HB fainter plate denser to HB; beyond = in density;
falling off in density in other plates in same box

Apr. 22

9207

9162

H γ larger than in 9911; Solar lines = 9911
Solar lines, H β , and ~~H γ~~ R of H β , all fainter

H β fainter, but similar He to red of H β about = 9911
than in 9207

Apr. 26

Lines in 10 549 and 10 276 are of about equal width. The emission seems just as strong in 10 549 as in 10 276; but the absorption also shows in H β in 10 549; while it is faint and ~~fat~~ ^{displaced} ~~shifted out~~ more to the red than in 10 549.

B11105 class I May 10, 1894 $H\beta$ ~~light~~ dark

3607 $H\beta$ dark

Wrong star

B42253 Apr. 26, 1911 $H\beta$ dark

4969 1890 dark $H\beta$?

3607 dark

B42253 stars at R.A. 14.52, Dec. $-41^{\circ}40'$ & $-42^{\circ}45'$ of
about the same magnitude show H lines; but
 η Cent. shows no lines in region of $H\beta, H\gamma, H\delta$

Apr 22

$$\begin{matrix} \eta & \cdot & d \\ a & \cdot & \cdot \\ i & & \end{matrix}$$

a m

 $a = b \quad 1 > d$ $c \xrightarrow{\text{same}} a$ $c \rightarrow \eta$ $\eta > a, b$

5389

5396

5389

5396

5407

5423

5463

5542

5574

same

wrong identification

Plat B22997 has η
Centauri marked
A.M. 6275 has η Cent marked

51

a.

Apr. 26 η .

b

c

no star near enough in field of eye piece
for comparison.

$$6275 \quad \eta < a$$

$$\eta = b$$

$$\eta > c$$

$$7627 \quad \eta = a$$

Apr. 27

a.

53

$$7627 \quad \eta < a$$

$$\eta = b$$

$$\eta > c$$

Aug 1911
 $b > c$
 η
 $\begin{matrix} b \\ c \end{matrix}$
 Aug 1, 1911

$$6857 \quad \eta = a$$

$$\eta > b$$

$$\eta > c$$

Mar
~~Apr~~ 1910

$$6886 \quad \eta < a$$

$$\eta > b$$

$$3 > c$$

Apr 1910

$$6934 \quad \eta = a$$

$$1 > b$$

$$3 > c$$

May 27 1910

$$6951 \quad \eta = 1 < a$$

$$1 > b$$

May 1910

$$7657 \quad \eta < a$$

$$1 > b$$

Aug 5 1911

$$7689 \quad \eta < a$$

$$1 > b$$

Aug 12, 1911

$$6237 \quad 1 < a$$

$$1 > b$$

June 1909

$$6346 \quad \eta = a$$

$$\eta > b$$

$$b > c$$

July 1909

Apr 27

Gm 43

$$\eta 2 < a$$

$$1 > b$$

$$b 3 > c$$

Aug 1899

$$a > b$$

60

$$\eta 1 > b$$

$$= a$$

$$\eta < a$$

$$> b$$

$$a > b$$

497

$$\eta = a$$

$$2 > b$$

June 1900

$$\eta > b$$

$$\eta < a$$

529

$$\eta = a$$

$$2 > b$$

July 1900

$$\eta < a$$

$$\eta > b$$

$$a > b$$

573

$$\eta 1 < a$$

$$2 > b$$

Aug 1900 $b 3 < a$

704

$$\eta = a$$

$$2 > b$$

Apr 1901 $b 3 < a$

840

$$\eta 1 < a$$

$$1 > b$$

$$b 3 < a$$

Apr 27

55

1188	$\eta < a$ $> b$	$a > b$	Apr 1902
1205	$\eta < a$ $> b$	$a > b$	Apr. 1902
1212	$\eta < a$ $\eta > b$	$a > b$	Apr. 1902
1241	$\eta < a$ $> b$	$a > b$	May 1902
1324	$\eta = a$ $> b$	$a > b$	June 1902
1826	~~$\eta > a$~~ $\eta < a$ $\eta > b$	$a > b$	Feb 20 1903
1853	$\eta < a$ $> b$	$a > b$	Apr 1903
1861	$\eta = a$ $> b$	$a > b$	Apr. 3 1903 Apr. 17 1903

Apr 26 27

1965

no image lacking in tail of η
 $\eta < a$
 $\eta > b$ $a > b$

May 1903

1979

 $\eta < a$ $a > b$
 $\eta < b$

June 1903

2845

 $\eta < a$ $a > b$
 $\eta > b$

July 1904

2905

 $\eta < a$ $a > b$
 $\eta > b$

Aug 1904

3402

 $\eta < a$ $a > b$
 $\eta > b$

Mar 1905

3429

 $\eta > b$ $a > b$
 $\eta < a$

Apr 1905

1940 July

59

Variable stars on MF plates, $14^h 12^m - 35^\circ$,
series loaned to L.B. Allen at Hood College
Observations of magnitudes in notebooks at Hood.

L.B. Allen
designationApprox. per. and mag.
Estimated by L.B. Allen

1	H.V. 7482 completed by other observers	
2	T W Cen.	" " "
3	AQ Cen ~~Prager 1946 -33 -35° 6080, 13^h 56^m 28^s -35° 55.3'~~	465
4	HV 8570 (Luyten)	245d. 11.9-13.6
5	HV 8579	245d. 11.9-13.6
6		1462 12.6-13.7
7	H.V. 8560 (Luyten)	247 12.4 -
8	Completed by Mr. Lee Cloud	
9 (not v. 9)		Short 13.2-14.3
12		" 12.5 - 14
13		" 12.3 - 13.1
14		13.0 - 13.5
15		Short 11.9 - 12.9
16		
17		Short 13.5 - 14
18	-35° 6080 13 ^h 56 ^m 28 ^s -35° 55.3'	11.6 - 12.5
19 (not v. 9)		
20		
21		
22		
23	with ^A 1593	
24		
	HV 8556	
	HV 8577	

Approximate periods found in 1941.

V. 7. 270 days, 12.5^m to below plate

V. 11. $0^d.60136$

V. 14 About 100 days

V. 19 $0^d.43927$, $13.0^m - 13.7^m$

V. 25 $0^d.49904$, $13.5^m - 13.8^m$

Observations of var. on plates of this region made in Cambridge Aug. 1941 are in a notebook taken by L.B.G.

Aug. 26, 1942 HV 8556 on A 16084. Its position is marked on A 3087, but no star is visible. It is not visible on the MF plates inspected, all ^{of the area} not loaned to Hood College.

HV 8577 on A 15936. Not seen on the MF plates, all inspected of the area which are not at Hood.

Aug. 27, 1942. V. 5, 7, 10, 14, A2 inspected on A plates: 3087-19235 which have these regions. Estimates in notebook taken by L.B.G.

Equatorial coordinates from
A plates and Cape Phot. Durch. cor. to 1900.

Aug. 1, 1940

				X mm	4.82 X	13
V.5 Pl. A 4275	-31° 3772	14 ² 10 46.1	-31° 45' 3	-1.5	-7.33	-14.3
check	-32 35 98	10 19.2	-32 27.6	+4.1	+20.61	+28.4
mean α and δ		26.8	42.3		27.3	42.7
V.6 Pl. A 4275	-31° 3772	14 10 46.1	-31 45.3	0	0	-3.5
check	-32 35 98	10 19.2	-32 27.6	+5.8	+28.4	+39.2
mean α and δ		26.9	42.3			42.7
V.11, Pl. ^A 18830	-34° 6096	14 23 46.0	-34 46.2	+12.6	61.5	-2.5
	-34 6106	25 30.4	50.6	-9.0	44.0	+2.5
		104.5	4.3		105.5	5.0
V.12 Pl. ^A 18830	-35° 6257	14 23 51.8	-35° 31.2	+5.4	26.9	-7.2
check	35 6272	25 32.1	-35 43.7	-14.6	-71.6	+6.3
mean α and δ		100.3	12.5		98.4	13.5
V.14. Pl. 18830	-32° 3610	14 ² 13 ^m 56.5	-32° 46' 0	+4	1.952	-16.3
	-33 3606	14 14 5.6	-33 28.9	-1.1	-8.4	+27.3
		9.1	42.9		7.4	43.6
V.15 Pl. 18830	-33 3606	14 14 5.6	-33° 28' 9	-7.6	-37.1	-27.2
	-33 3602	14 12 55.6	-33 38.4	+7.3	+35.7	-17.9
	-34 6055	14 14 1.9	-34 14.8	-6.4	-31.3	+18.8
check, mean α and δ		60.0 3.7 67.3	9.5 45.9 36.4		58 72.8 67.0	9.3 46.0 36.7

α	δ			
10 ^m 38.5	-31° 59.6			
10 39.2	-31 59.2			
14 ^h 10 ^m 39.0	-31° 59.4	=H.V 8579		
10 46.1	-31 48.8			
10 47.6	-31 48.4			
14 ^h 10 ^m 46.8	-31° 48.6			
24 47.5	-34 48.2			
24 46.6	-34 48.1			
14 24 46.8	-34 48.2			
14 24 18.7	-35 38.4			
24 20.6	37.4			
14 24 19.6	-35 37.9			
14 13 58.5	-33 2.3			
14 0.2	1.6			
13 59.4	-33 2.0			
14 13 28.5	-33 56.1			
13 31.3	56.3			
13 30.6	56.0			
14 ^h 13 ^m 30.1	-33° 56.1			

				$x \text{ mm } 4.88 \times$	y
V.16 Pl. A18630	-33° 35 94	14 10 8.8	-33° 57.1 -1.7 -8.3		-10.6
check, mean id and 8	-34° 60 37	14 9 46.9 21.9	-34 14.4 +3.0 +14.6 17.3 22.9		+7.0 17.6
V.17 Pl. A18630	-32 35 82	14 6 7.0	-32 12.8 +18.8 48.8		-18.1
check and mean and 8	-32 35 85	14 6 41.5 34.5	-32 50.0 -5.9 -28.8 37.2 37.6		+19.3 37.4
V.18 Pl. A18630	= -35° 60 80				
V.20 Pl. A18630	-33 35 55	13 57 19.6	-33 63.4 +15.7 +76.8		-3.3
check	-34 59 49	13 59 0.3 106.7	-34 13.3 -7.1 -34.7 9.9 111.3		+5.9 -9.2
mean and 8					
V.22 Pl. A3656	-39 61 95	14 00 25.3	-39 30.4 +29.		+3.3
	-39 62 06	14 1 6.0	-39 22.0 -4.6		-5.9
V.23 Pl. A15936	-31° 37 72	14 10 46.1	-31 45.3 +2.2		+1.2
	-31 37 73	14 11 0.9	-31 28.1 -1.3		-16.5

α 1900 δ 1900

14 ^h	10 ^m	0.5 ^s	-34°	7.7
-----------------	-----------------	------------------	------	-----

14	10	1.5	-34	7.4
----	----	-----	-----	-----

14	10	1.0	-34	7.6
----	----	-----	-----	-----

14	6	15.8	-32	30.9
----	---	------	-----	------

6	22.7	-32	30.7
---	------	-----	------

14 ^h	6 ^m	14.2 ^s	-32°	30.8
-----------------	----------------	-------------------	------	------

13 ^h	57 ^m	28.3	-35°	52.3
-----------------	-----------------	------	------	------

13	58	20.4	-34	6.7
----	----	------	-----	-----

13	58	25.6	-34	7.4
----	----	------	-----	-----

13	58	30.0	-34	7.0
----	----	------	-----	-----

ab	ab	ab	ab	em	em	em	em
8493	9583	9619	9523	10600	10676	10328	10276
7508	9576	9531	10555	10540	994	10324	10273
8505	9548	9519	10554	10535	9280	10318	9609
9495	9539	9495	9515	10307	9290	10313	9602
9312	9527	9162	9548	10543	9312	10547	5759
5759	9162	9499	9519	10326	10871	10329	9505
	9495	9141		10547	10672	28	9224
	10754	9510			10559	27	9053
	9162	9207			10740	25	9052
	9602	10754			10559	24	10605
	9053	10740				15	10594
		10737				04	10543
		10729				10	10528
		10549					10329
		10547					10328
		10543					10327
		10524					10325
		9911					10321
		9290					10315
		9280					10304
		9527					10301
		9207					10298
		9052					10295
		9224					10292
							10282
							10288
							10289
							10285

$$\begin{array}{r}
 13694 \\
 14045 \\
 \hline
 14049
 \end{array}$$

$$\begin{array}{r}
 4801 \\
 4815
 \end{array}$$

$$\begin{array}{r}
 7508 \\
 8493 \\
 8505
 \end{array}
 \left. \vphantom{\begin{array}{r} 7508 \\ 8493 \\ 8505 \end{array}} \right\}
 \begin{array}{r}
 13694 \\
 14045 \\
 14049 \\
 05 \\
 \hline
 366
 \end{array}$$

$$\begin{array}{r}
 2358 \\
 \hline
 50 \\
 1420 \\
 \hline
 1444
 \end{array}$$

$$\begin{array}{r}
 9583 \\
 10754 \\
 9519
 \end{array}
 \left. \vphantom{\begin{array}{r} 9583 \\ 10754 \\ 9519 \end{array}} \right\}
 \begin{array}{r}
 14815 \\
 16337 \\
 4820 \\
 \hline
 522
 \end{array}$$

$$\begin{array}{r}
 21522 \\
 \hline
 21 \\
 50 \\
 \hline
 304
 \end{array}$$

$$\begin{array}{r}
 9539 \\
 9495
 \end{array}
 \begin{array}{r}
 4794 \\
 4804 \\
 \hline
 10
 \end{array}$$

$$\begin{array}{r}
 13 \\
 118 \overline{) 1522} \\
 \underline{118} \\
 342 \\
 \underline{254} \\
 -12
 \end{array}$$

$$\begin{array}{r}
 9162 \\
 9505
 \end{array}
 \begin{array}{r}
 4437 \\
 4797 \\
 \hline
 360
 \end{array}$$

$$\begin{array}{r}
 108 \overline{) 1537} \\
 \underline{108} \\
 457 \\
 \underline{447} \\
 10 \\
 109 \overline{) 1537} \\
 \underline{109} \\
 447 \\
 \underline{436} \\
 11
 \end{array}$$

$$90 \overline{) 1537} \\
 \underline{1707}$$

$$\begin{array}{r}
 360 \overline{) 1537} \\
 \underline{1440} \\
 97 \\
 97 \overline{) 360} \\
 \underline{388}
 \end{array}$$

$$90 \overline{) 360} \\
 \underline{4}$$

1911phae.proj..686A