

SPECTRAL TYPES OF SOME ECLIPSING BINARIES

NANCY G. ROMAN

Yerkes Observatory

Received October 5, 1955

ABSTRACT

Spectral types are given for one or both components of sixty-three eclipsing binary systems.

For the solution of the light-curves of an eclipsing binary, it is useful to know the spectral types of the component stars. Therefore, a program was begun several years ago to obtain spectral types for all eclipsing binary systems easily observed with the Yerkes 40-inch refractor. The plan was to take two or three plates of each star, distributed in phase to allow some separation of the spectra of the two components. The program is still incomplete, but the results obtained to date are collected in Table 1.

This table lists the Universal Times of the plates obtained, the phases at mid-exposure counted in fractions of a period from the preceding primary minima and computed with the elements in Kukarkin and Parenago's catalogue (1948), the spectral types, and additional remarks. Where only one type is given for several plates, either no change in type could be detected between them, or each is a composite of the two types given. The A-type stars without luminosity classes are probably dwarfs but could be as bright as class III. Remarks about broad and sharp lines refer to the low dispersion used (125 Å/mm at H γ); the broad lines near quadrature probably result from double lines.

REFERENCES

Kukarkin, B. V., and Parenago, P. P. 1948, *General Catalogue of Variable Stars* (Moscow).

TABLE 1
OBSERVATIONAL DATA

Star	Year	Date	Begin	End	Phase	Sp. Type	Remarks
RT And. . . .	{1954 1954	July 15 Aug. 12	6:05 4:58	7:37 5:44	0.03 .45	F8 V F7 V	
ST Aqr.	{1954 1954	Aug. 29 Sept. 22	5:03 4:50	5:57 6:00	.02 .75	G8 IV::+A7:	The A star is brighter than the G8 star
σ Aql	{1954 1954 1954	July 15 Aug. 1 Oct. 7	2:53 6:42 1:44		.70 .50 .75	B3 V	Lines broad
KO Aql	{1954 1954	Aug. 12 Sept. 11	3:10 4:50	4:18 5:56	.54 .04	A2 A0	
OO Aql.	{1953 1954 1954 1954	June 23 July 15 Sept. 8 Sept. 11	5:50 8:10 1:18 2:17	7:02 8:47 2:24 2:57	.02 .81 .79 .77	G5 V: G2 V G5 V:	Lines are very broad on all plates
V 337 Aql.	{1953 1954	June 23 Aug. 12	4:48 2:04	5:38 3:05	.75 .51	B0 5 V	Broad lines.
WW Aur.	1954	Jan. 15	5:43		.76	A7	The K line is rather broad but quite shallow; this could be explained by a composite spectrum such as A0+F2, but the hydrogen lines are probably not strong enough for this
BF Aur.	1954	Nov. 17	4:17	5:29	.22	B5 V	Very broad lines, possibly double
RS CVn	1953	June 9	4:52	5:59	.01	K2 III	
RZ Cas	1954	Nov. 17	4:10		.49	A2	
TW Cas	1954	Nov. 17	3:32	4:02	.91	A1	
TX Cas.	1953	Sept. 5	8:55	10:05	.75	B1 V	
YZ Cas.	{1953 1954	Sept. 16 Nov. 17	8:39 0:32		.50 .01	A2 A3	
AO Cas	1954	Sept. 22	4:30		.43	O9 V	
AR Cas.	{1954 1954	Aug. 1 Nov. 3	4:34 5:44		.04 .54	B3 V	
BM Cas	1953	Sept. 16	7:24	8:28	.92	F0 Ia	
CC Cas	1954	Nov. 17	0:06	0:22	.20	O9 V	
U Cep	1953	Sept. 6	5:43	6:44	.98	G8 III	
VW Cep	{1954 1954 1954	July 2 July 15 Aug. 29	6:44 3:44 2:01	7:00 4:17 2:51	.31 .58 .03	K0 V	Broad lines
WX Cep	{1954 1954	Aug. 1 Aug. 26	4:43 2:28	5:29 3:43	.62 .00	A7	
XZ Cep.	1954	Sept. 8	4:03	4:44	.85	O9 5 V	
AH Cep.	{1954 1954	Sept. 22 Sept. 26	2:10 1:43	2:17 1:50	.49 .73	B0 5 III	
U CrB.	1953	May 31	4:27	4:44	.56	B7 V	
RV Crv.	1955	Feb. 12	3:12	4:37	.61	F0+G0:	
Y Cyg.	{1954 1954	July 2 Aug. 29	6:22 3:37	6:32 3:55	.17 .49	B0 V	Broad lines
GO Cyg	{1954 1954 1954	July 15 Aug. 1 Aug. 12	8:51 3:59 4:25	9:11 4:25 4:50	.01 .41 0 76	A1	

TABLE 1—Continued

Star	Year	Date	Begin	End	Phase	Sp. Type	Remarks
V 367 Cyg	1954	Sept. 11	1:28	1:40	0 25	A7 Ia	
V 382 Cyg	1954	Sept. 26	1:59	3:05	.75	O9 V	
V 453 Cyg	{1953	Sept. 6	1:18	1:51	24}	B1 III	
	{1954	Sept. 25	4:29	5:05	00}		
DM Del	1954	Sept. 26	4:30	4:58	99	A3	
TW Dra	{1953	May 27	3:05	3:48	76	A5	The A5 star is much brighter
	{1953	Sept. 6	2:32	2:41	09	K0 III	
S Eql	1953	Sept. 6	1:55	2:16	11	B8 V	
WX Eri	{1953	Sept. 5	7:21	8:42	02}	A7+F6 V:	
	{1953	Sept. 21	9:26	10:45	56}		
u Her	{1953	June 9	6:17	6:24	76}	B3 III	Broad hydrogen lines
	{1954	Sept. 11	4:16		.51}		
	{1954	Sept. 12	4:19	4:24	00}		
Z Her	{1953	May 28	4:17	4:36	50}	F6 V	
	{1953	May 31	4:50	5:01	26}		
RX Her	{1954	July 19	5:49	6:13	49}	A0	K line broad
	{1954	Aug. 1	3:45	3:55	75}		
	{1954	Aug. 12	5:55	6:27	.99}		
TX Her.....	{1953	May 31	5:45	6:11	74}	A7	Lines broad Lines sharp
	{1954	Oct. 7	1:52	2:40	49}		
AK Her..	{1953	June 9	6:33	7:01	76}	F2+F6	
	{1954	Aug. 1	3:11	3:41	08}		
	{1954	Sept. 12	1:23	2:08	55}		
DI Her	{1953	Sept. 3	2:02	3:02	.71}	B5 III	
	{1953	Sept. 6	4:26	5:25	01}		
HS Her	{1954	Sept. 12	2:42	3:09	48}	B5 III	
	{1954	Sept. 26	0:53	1:31	.98}		
AI Hya	1954	Jan. 15	5:55	6:51	?	F0+F5	Period too inaccurate to compute phase; Sr II, λ 4077, unusually strong
SW Lac	1954	July 18	6:22	7:12	59	K0 V	H and K emission
	{1954	Aug. 12	6:39	7:02	50	K2 III+F8::	
AR Lac	{1954	Aug. 29	2:59	3:31	.00	K2 III	
	{1954	Sept. 22	3:47	4:03	12		
CM Lac ..	1954	Nov. 3	5:54	6:50	.99	A7	
CS Lac	1954	Sept. 26	5:04	6:02	.8	B5 V	
TX Leo	1953	May 31	2:52		00	A2	
δ Lib ..	1953	May 31	4:09		00	A0	
U Oph....	{1953	June 9	6:10		56}	B5 V	Sharp lines Broad lines
	{1953	June 11	8:44	8:50	82}		
V 451 Oph	{1953	June 23	4:05	4:25	.64}	A0	
	{1954	July 15	4:38	4:51	.02}		
	{1954	Aug. 1	5:39	6:01	54}		
V 456 Oph.	{1954	Sept. 8	5:06	6:05	?	A5:	Plates somewhat underexposed; period too uncertain to predict phases
	{1954	Sept. 11	3:06	4:07	?		
V 502 Oph..	{1953	May 31	5:07	5:39	25}	K0 IV:+F5:	Plate at primary minimum somewhat underexposed
	{1953	June 9	4:19	4:41	02}		
	{1954	July 19	2:45	3:45	0 12}		

TABLE 1—Continued

Star	Year	Date	Begin	End	Phase	Sp. Type	Remarks
V 566 Oph	{ 1953	June 11	8:56	9:15	0 22	F4 V	H and K emission; the K star is much brighter
	{ 1954	July 15	5:02	5:30	40		
	{ 1954	Sept. 26	3:28	3:58	97		
AW Peg...	1954	Sept 8	3:44	3:56	15	A5	
EE Peg	1954	July 19	5:06	5:20	00	A3	
AY Per	1953	Nov. 14	6:08	7:36	54	A0	
SZ Psc	{ 1953	Sept. 21	7:25	7:54	48	K1 III+A	
	{ 1954	Sept. 25	5:09	6:05	49		
U Sge	{ 1953	May 31	6:32	6:37	50	B7 III	
	{ 1954	Sept. 8	2:33	3:34	01	K1 III	
V 505 Sgr	1954	Sept. 26	4:04	4:22	01	F6: +A3	
RZ Sct ...	1953	Sept. 3	1:29	1:50	34	B0 V	
W UMi.	{ 1953	May 31	3:11	3:55	50	A2	
	{ 1953	June 23	2:48	3:56	01	A3	
UY Vir .	1953	June 9	2:48	3:11	73	A7 V	
Z Vul.	{ 1953	May 31	6:42	6:51	70	B5 V	
	{ 1953	June 23	4:33	4:42	03		
	{ 1954	Aug. 29	4:07	4:54	00		
RS Vul .	1953	May 31	6:19	6:29	0 24	B5 V	