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A POSSIBLE NEW BINARY STAR IN SAGITTARIUS

In a recent paper, Campos and Sanchez (1987) reported the variability of six new variable stars in the constellation of Sagittarius. These discoveries were carried out in photographic plates dating from 1942 to 1954, but their report did not include the type of variability of each star.

The present paper reports the variability of one of these stars, ("B"), with the following coordinates; RA = $18^h40^m26^s$, DEC = $-29^o6'6''$ (2000), based on the same photographic material utilized by Campos and Sanchez (1987). The variability of the star is striking since it appeared in some plates with equal brightness when compared to the same standard plate (BM 111) used by Campos and Sanchez (1987) and it did not appear in some other plates. Since the limit of detectability on the 60 min exposed plates is of about 14 mag, it was safely concluded that at certain times the star was fainter than this magnitude.

The entire collection of plates with exposures times of 50 and 60 minutes was compared with respect to the BM 111 plate and the results are presented in Table I and shown schematically in Figure 1. From the light curve of the "B" star it can be concluded that it might be an eclipsing binary with an amplitude of variation larger than 2 magnitudes and a period of about seven years.

Recent observations, at the 1.5 m telescope of San Pedro Martir Observatory carried out with the Danish photometer, on the night of June 21-22, 1987 indicate that the V magnitude of this star in that time was of 12.54 mag.

Of course, the material available does not exclude another type of variability, such as a flare star or a nova-like object, particularly because of

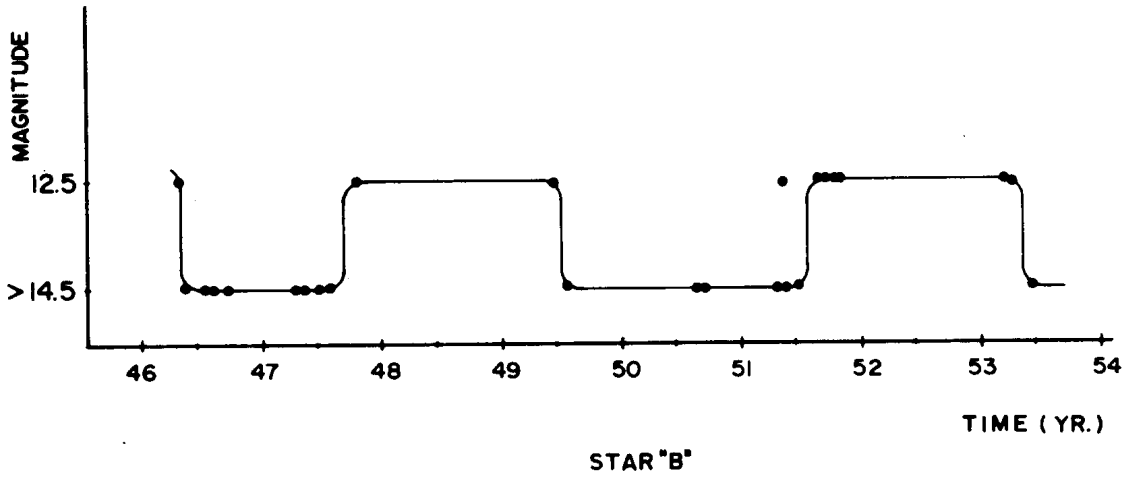

Figure 1

Light curve of the suspected variable star. When the star was visible a visual magnitude of 12.5 was assumed. At other times it was fainter than 14 mag., the detection limit. To convert the x axis into years, add 1900. The continuous line is an eye-ball free-hand fit through the points.

Table I. Log of observations of the suspected new variable star. In the column denoted by E, Y indicates that the star was visible, N that was not detected.

DATE	PLATE	EXPOSURE TIME (MIN)	E
1942 Apr. 9-10	BM 111	60	Y
1946			
Apr. 1-2	1127	60	Y
3-4	1134	60	Y
5-6	1143	60	Y
6-7	1146	60	Y
7-8	1149	60	Y
May 30-1	1151	60	N
Jun. 22-23	1157	50	N
25-26	1158	60	N
25-26	1159	50	N
25-26	1160	50	N
25-26	1161	50	N
25-26	1162	50	N
25-26	1163	50	N
26-27	1165	50	N
26-27	1166	50	N
26-27	1167	50	N
26-27	1168	50	N
27-28	1169	50	N
27-28	1170	50	N
27-28	1171	50	N
27-28	1172	50	N
27-28	1175	50	N
Jul. 26-27	1177	60	N
27-28	1179	60	N
Aug. 29-30	1191	60	N
1947			
Mar. 26-27	1318	60	N
Apr. 16-17	1319	60	N
21-22	1321	60	N
Jun. 14-15	1326	60	N
Jul. 9-10	1331	60	N
15-16	1332	60	N
Sep. 16-17	1344	60	Y
1950			
Aug. 6-7	1433	50	N
9-10	1435	60	N
10-11	1436	50	N
11-12	1437	60	N

Table I (cont.)

	DATE	PLATE	EXPOSURE TIME (MIN)	E
1951				
Apr.	10-11	1464	60	N
	12-13	1465	50	N
	17-18	1466	60	Y
May	3-4	1469	60	N
	6-7	1471	60	N
	7-8	1472	50	N
Jun.	7-8	1477	50	N
	7-8	1472	50	N
Aug.	6-7	1489	60	Y
	27-28	1439	60	Y
Sept.	25-26	1498	60	Y
	27-28	1499	60	Y
1953				
Mar.	11-12	1664	60	Y
	16-17	1666	60	Y
	17-18	1667	60	Y
	19-20	1668	60	Y
	23-24	1669	60	Y
	25-26	1671	60	Y
Apr.	23-24	1679	60	Y
May.	18-19	1683	60	N

the existence of only one isolated visible point in April, 1951, surrounded by five undetectable points all taken in about the same epoch. Therefore, more observations are needed for the accurate determination of the real nature of this star.

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Reference:

Campos, J., and Sanchez, A., 1987, Inf. Bull. on Var. Stars No. 3030