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ECLIPSING BINARY V530 Cyg=S 4539, FORMER Ins(a)-TYPE VARIABLE

The eclipsing binary V530 Cyg=S 4539 was discovered in the course of Sonneberg survey program (Ahnert et al., 1949). The following light elements were determined:

$$\mathrm{Min}=2429112.56+50^{\mathrm{d}}.8611\times\mathrm{E}$$

Ahnert et al. (1949) determined the initial epoch and the period close to reality, but later on these elements were disregarded. Kukarkin et al. (1958) included V530 Cyg in the Second Edition of the General Catalog of Variable Stars (GCVS) as an RW Aur type variable. In the Third and Fourth Editions of the Star was marked as an Ins(a)-type variable of B5: spectral type. Kholopov (1959) supposed V530 Cyg to be a member of the Cyg T2 association. Filipiev (1980) did not find any light variability of the star. Pugach (1988) observed three minima of V530 Cyg and proposed a new formal period of $P=35^{\mathrm{d}}.519958$. Though, those moments of minima are well described with the above-mentioned ephemeris. Moreover, Pugach (1988) noted the presence of a shallow H absorption line profile.

In 1990 V530 Cyg was included in Mt. Maidanak ROTOR observational program (Shevchenko, 1989) to investigate its variability.

Our observations of V530 Cyg were made using the 0.5-m reflector equipped with UBVR pulse counting photometer. 300 UBVR magnitudes were obtaine during 4 observational seasons.

We have recorded 9 times of the primary minimum and calculated the improved elements using all data of other authors:

$$\mathrm{MinI}=\mathrm{JD.Hel.}\,2448072.594+50^{\mathrm{d}}.83141\times\mathrm{E}$$
$$\pm 0.005\pm 0.00005$$

Julian Dates of the minima with phases and UBVR-data are listed in Table I. The folded V-curve and its primary minimum are shown in detail in Figures 1 and 2, respectively.

We have not enough data in the minimum to make an orbital solution. Nevertheless, we made a preliminary analysis of the light curve.

We suppose the following:

1. There is a partial eclipse at the minimum.
2. The secondary (fainter) star is passing in front of the small B5 primary in the primary minimum (see Figure 2.).

Table I

JD.Hel 2400000+	Phase	V	U−B	B−V	V−R
8072.3946	.996	12.33	0.05	0.63	0.68
8123.3514	.997	12.41		0.63	0.63
8174.1931	.999	12.38		0.66	0.63
8428.4361	.000	12.40		0.65	0.61
8479.3323	.001	12.42	0.04	0.65	0.66
8835.3494	.004	12.36	0.01	0.65	0.59
8886.1710	.004	12.34	−0.02	0.65	0.61
9190.3641	0.989	12.10	0.04	0.61	0.62
9191.3547	0.008	12.18	0.00	0.64	0.63
9241.2487	0.990	12.15	0.03	0.62	0.62
mean light in maximum		11.82	−0.01	0.62	0.61

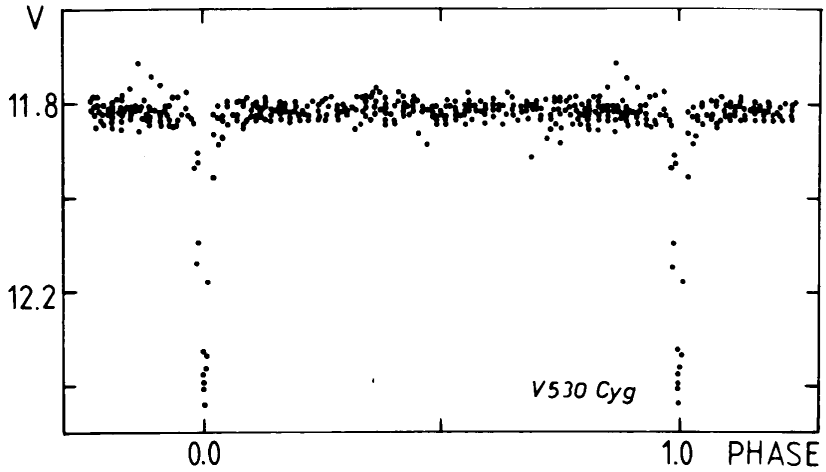

Figure 1. The V curve of V530 Cyg.

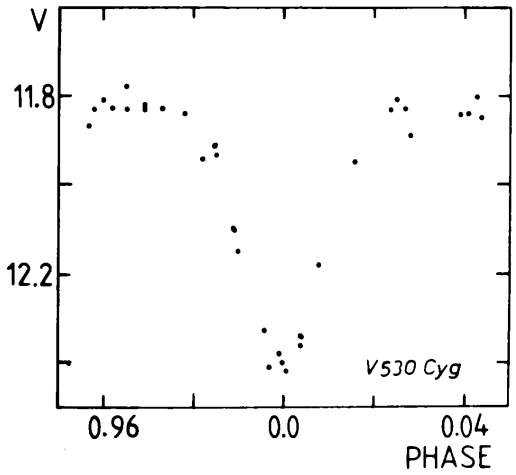

Figure 2. The minimum of V530 Cyg.

Taking into account the B5 spectral type of V530 Cyg we consider the total mass of the binary system not to be less than $8M_{\odot}$.

Then $R_1>5R_{\odot}$, $R_2>8R_{\odot}$, $M_v<-1.5$, $A_v\approx2.4$, $M-m>10.9$, $r>1.5$ kpc.

It takes about two more observational seasons to obtain the primary minimum in detail.

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