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A VERY INTERESTING VARIABLE V 627 Cas (AS 501): BRIGHTENING FORECAST FOR
MID-1991

Herbig and Rao (1972) included the object AS 501 (designated as V 627 Cas) from the list of Merrill and Burwell (1950) into the second catalogue of young stars with a sense of doubt. The spectral class of the star is around M2-M4 with H, TiI, FeI and FeII emission lines. It shows marked over-abundances in the UV and IR emission and high level of linear polarization. OH and H₂O maser emission has been also found in the direction toward this object. The problems connected with the uncertainty in the evolutionary status of V 627 Cas were earlier discussed in details by Derviz and Kopatskaya (1981), Kolotilov (1988) and Bergner et al. (1988).

The UBVRIC observations were carried out in 1974-1984 by Kopatskaya (1986) did not show any periodicity in the optical light variability. The results of UBVRIC photometry of V 627 Cas carried out in 1983 - 1988 are published in the papers of Taranova and Yudin (1987), Goransky and Kolotilov (1988) and Bergner et al. (1988). In particular Kolotilov (1988) suspected the presence of an optical burst with the period close to 900 days.

In 1988-1990 we proceeded the optical and IR photometry of V 627 Cas, the results of which are to be published elsewhere. Figure 1 shows the light curve of V 627 Cas in the V band folded with the period of 900 days through the whole bulk of 1983 - 1990 data. The maxima were observed in the end of 1983, in mid-1986 and in the end of 1988, the next brightening is forecasted for mid-1991. The brightness of V 627 Cas in 1983 - 1990 in the IR bands did not show any visible changes ($\Delta J \leq 0.1^m$).

Let us note that, in addition to the photometric measurements, one of the authors (A.S.M.) obtained the record of V 627 Cas on the 6-m telescope of the Special Astrophysical Observatory in the wavelength range $\lambda\lambda$ 3816 - 5664 Å. The observations were made in January 1989. Primarily, numerous TiO absorption bands and the H_β emission are evident here. Later, in August 1989 the record of the spectrum in the wavelength range $\lambda\lambda$ 4000 - 7500 Å was obtained by Mendoza et al. (1990). It shows the TiO bands and the H_α emission.

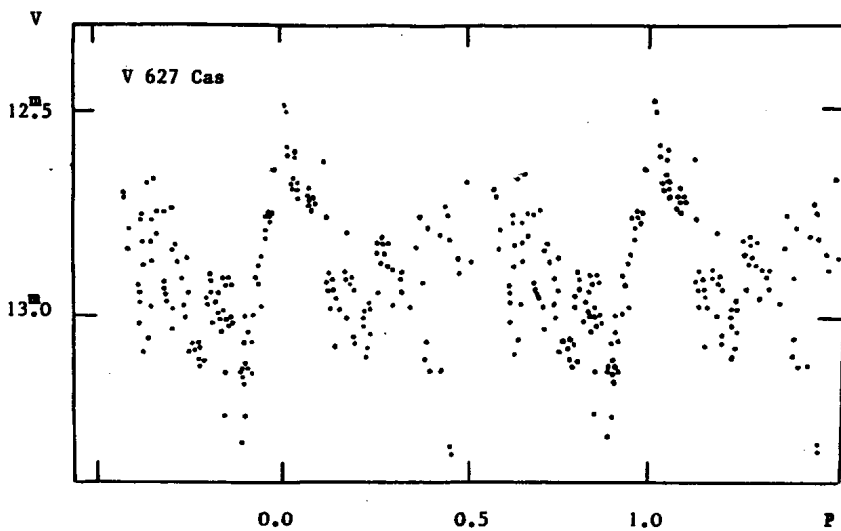


Figure 1

Earlier Kolotilov (1988) undertook an attempt to classify V 627 Cas as a nova-like symbiotic star. In this case the periodicity of the light curve could have been associated with the orbital period of the system. However, V 627 Cas differs from the known symbiotic stars by a number of parameters.

On the other hand, V 627 Cas cannot be classified as a young star of T Tau type. Particularly, on the IR color diagrams (in the range 2.2-60 μm) it coincides with the OH/IR stars. Besides, if we regard it as a member of young stellar association near DI Cep, the bolometric flux from V 627 Cas calculated with respect to the IRAS data being $F_{\text{bol}} \approx 1.4 \cdot 10^{-7} \text{ erg/cm}^2 \text{ sec}$ is about 30 times as high as the one from DI Cep, belonging to typical T Tau stars.

Thus, the evolutionary status of V 627 Cas still remains uncertain. Formally, it is possible to interpret the available observational data assuming that we observe a peculiar red giant and a young star in the same direction. In the opposite case we are probably dealing with a symbiotic system, where the hot component is showing very violet ($\Delta U \approx 0.6$ at $B \approx \text{constant}$), or very blue ($\Delta B \approx 0.5$ at $V \approx \text{constant}$) emission bursts.

Having noticed peculiar characteristics of the variable V 627 Cas and forecasting its brightening, we are calling the astronomical community for

various patrol observations of this star.

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References:

- Bergner, Yu.K., Miroshnichenko, A.S., Yudin, R.V., Yutanov, N.Yu., Kuratov, K.S. and Mukanov, D.B.: 1988, *Pis'ma Astron. J.*, 14, 616.
- Derviz, T.E., Kopatskaya, E.N.: 1981, *Pis'ma Astron. J.*, 7, 168.
- Goransky, V.P., Kolotilov, E.A.: 1988, *Variable Stars*, 22, 667.
- Herbig, G.H., Rao, K.N.: 1972, *Astrophys. J.*, 174, 401.
- Kopatskaya, E.N.: 1986, Dissertation, Leningrad University.
- Kolotilov, E.A.: 1988, *Astrofizika*, 29, 458.
- Mendoza, E.E., Rolland, A. and Rodriguez, E.: 1990, *Astron. Astrophys. Suppl. Ser.*, 84, 29.
- Merrill, P.W., Burwell, C.G.: 1950, *Astrophys. J.*, 112, 72.
- Taranova, O.G., Yudin, B.F.: 1987, *Astron. Tsirkular*, No.1501, 7.