COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 3532

Konkoly Observatory
Budapest
29 October 1990
HU ISSN 0374 - 0676

ON THE NATURE OF THE CATACLYSMIC VARIABLE V 426 OPHIUCHI

Previous photometric observational series of V 426 Oph led the authors to characterize it as "ex-nova" or as "nova-like" (Meinunger 1967; Beyer 1977; Shugarov 1980, 1983), after the earlier classification as RW Aurigae type (Hoffmeister 1949) had been discarded by Herbig (1960) because of the presence of the Balmer series and of He I in emission over a structureless continuum. Since the He I emission and parts of the previous light-curves are typical for dwarf novae, we decided to investigate the object on all suitable Sonneberg plates.

1676 observations on exposures of the Sky Patrol (SSP) and 255 observations on plates of the two 40 cm astrographs (time interval 1931...1988) could be gained. Our pg. magnitude system is based on the B system of Shugarov (1983). Pronounced standstills in intermediate magnitude could not be observed. Remarkable, however, is the presence of two different minimum levels ($12^m.90$ and $13^m.45$), which follow each other in an obviously irregular manner. Eruptions are frequent; their average height and their breadth (at a level of $12^m.0$) are $11^m.5$ and 4 days, respectively. From the latter quantity a mean cycle length of $\bar{C}$ = 33 days (SSP) can be derived by statistical methods, for instance according to Wenzel and Richter (1986).

What is important: On the average the cycle length depends on the magnitude of the minimum from which the eruptions ascend. This effect can be easily found already in the visual light-curve of Beyer (1977): Compare for instance the series of 1951 - minimum 12^m vis., $\bar{C}$ = 21 days, and 1952 - minimum 13^m, $\bar{C}$ = 42 days. Fig. 1, which is drawn on the basis of a concerted series of four-minute exposures with the GB astrograph, also

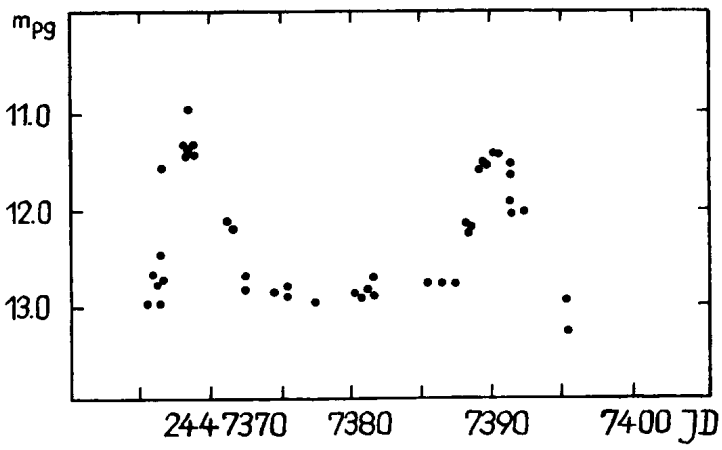

Figure 1

shows a good example for a short cycle length connected with a high level of the minimum (C = 22 days, minimum = $12^m.9$). In spring 1957 5 eruptions follow each other with a mean cycle length of 13 days and a minimum brightness of $12^m.8$; on the other hand there are numerous intervals of 25 to 40 days between eruptions, and the accompanying minimum state is around $13^m.5$. Also the photoelectrically determined curve of Shugarov (1983) seems to show the short value of C ≈ 16 days at a minimum level of B = $12^m.9$.

Orbital period (0.285 days, Hessman 1988), amplitude (≈ 2 mag) and mean cycle length (33 days) fit into the relationships governing these quantities of dwarf novae and found by Richter and Bräuer (1989).

We suppose that V 426 Oph is an SS Cygni star which can switch between stronger and lower mass-transfer rates. Hessman (l.c.) and Szkody/Mateo (1988) observed the object in the upper minimum level, as we can see from the brightness data given by them. They found an unusually high transfer rate and that (at least in the UV) a large part of the brightness comes from the accretion disc. The shortening of the cycle length (see above) in this "upper state" is also typical for a higher mass transfer.

Here possibly a single star demonstrates us (at least qualitatively) what Vogt (1981) considered as a statistical pro-

perty of the group of the dwarf novae as a whole, namely that the relationship amplitude/cycle length should be replaced by the relationship minimum luminosity/cycle length.

We thank Mr. G. Hacke and Mr. K. Heiland for nonschedule exposures and Dr. G.A. Richter for stimulating discussions.

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