THE SO-CALLED ANTIFLARE STARS

A. F. PUGACH

Main Astronomical Observatory, Ukrainian Academy of Sciences, Kiev, U.S.S.R.

Abstract. There seems to exist a small subgroup of irregular variables with light curves similar to R CrB stars but with a shorter time scale. These stars have small-amplitude light variations around a 'normal brightness', but this is interrupted by Algol-like minima of about $0^m.8$ to $2^m.0$ at irregular intervals. The duration of the minimum phase is several percent of the total time. While at minimum the variables also show rapid light variation of greater amplitude. Moreover, RZ Psc shows a flare activity, which strongly resembles that of UV Cet stars. The minimum phase is followed by a rapid recovery to the 'normal brightness'.

To be an antiflare object a star must satisfy certain conditions.

(1) The probability density function (or frequency distribution) of magnitudes should have a great positive asymmetry. As a consequence of this 'T' is much greater than 't', so are 'A' and 'a' (see Figure 1).

(2) Distribution of magnitudes at maximum is Gaussian.

(3) Brightness change rate during an antiflare is about $0^m.1$ an hour. Several examples are given in Figures 1–3. A list of 'antiflare' variables and some stars suspected to belong to this class are given in Table I.

TABLE I

Star	Amplitude	Sp	References
	Antiflare		
BO Cep	12.4–13.7 p	F2	5, 9, 16
V 530 Cyg	11.7–12.4 V	B5	8, 11
RZ Psc	11.6–13.2 V	G8-K0	6, 15
XX Sge	14.6–16.1 p	?	14
	Suspected		
V 589 Aql	14.7–16.4 p		5
V 362 Cas	12.0–13.2 p	?	8
V 379 Cas	9.3–10.3 p	F6	10
BH Cep	11.1–13.3 p	A4	4, 5, 9
V 575 Oph	14.0–14.6 p		5
IU Ori	9.6–11.1 p	K2	1, 2, 13
V 351 Ori	10.1–11.6 p	A2	3
IP Per	10–11 p	A3	7, 12

References to Table I

[1] Bateson, M. F.: 1972, *New Zealand Circ.*, No. 191.
[2] Eggen, O. J., 1973, *Publ. Astron. Soc. Pacific* **85**, 42.
[3] Filin, A. Aj.: 1951, *Astron. Circ.*, No. 111, 10.
[4] Hoffmeister, C.: 1936, *Astron. Nachr.* **259**, 37.
[5] Hoffmeister, C.: 1949, *Astron. Nachr.* **278**, 24.
[6] Karetnikov, V. G. and Pugach, A. F.: 1973, *Info. Bull. Var. Stars*, No. 783.
[7] Kippenhahn, R.: 1953, *Astron. Nachr.* **281**, 155.
[8] Meinunger, L.: 1966, *Mitt. Veränd. Sterne* **3**, 161.

Sherwood and Plaut (eds.), Variable Stars and Stellar Evolution, 143–145.

[9] Mosidze, L. N.: 1969, *Abastumani Bull.*, No. 37, 18.
[10] Nikulina, T. G.: 1959, *Astron. Circ.*, No. 207, 16.
[11] Pugach, A. F.: 1970, manuscript deposited in VINITI (Moscow), register 1982-70.
[12] Solovyev, A. V.: 1954, *Astron. Circ.*, No. 149, 20.
[13] Solovyev, A. V. and Erleskova, G. E.: 1962, *Tadjik Bull.*, No. 34, 3.
[14] Tsesevich, V. P. and Dragomiretskaya, B. A.: 1973, *RW Aurigae Stars.*
[15] Wenzel, W.: 1956, *Mitt. Veränd. Sterne*, No. 217.
[16] Wenzel, W.: 1961, *Veröff. Sonneberg* **5**, 60.

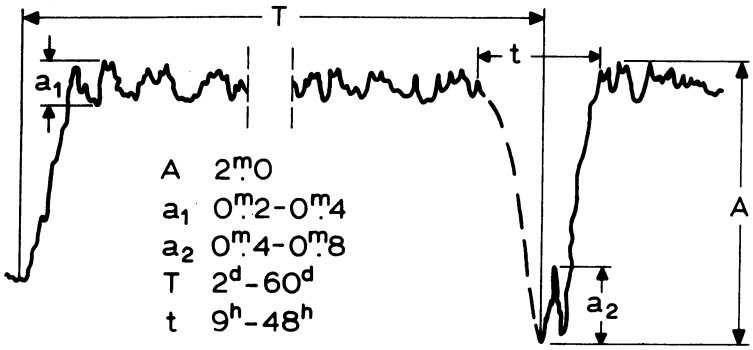

Fig. 1. Schematic light curve of an anti-flare star.

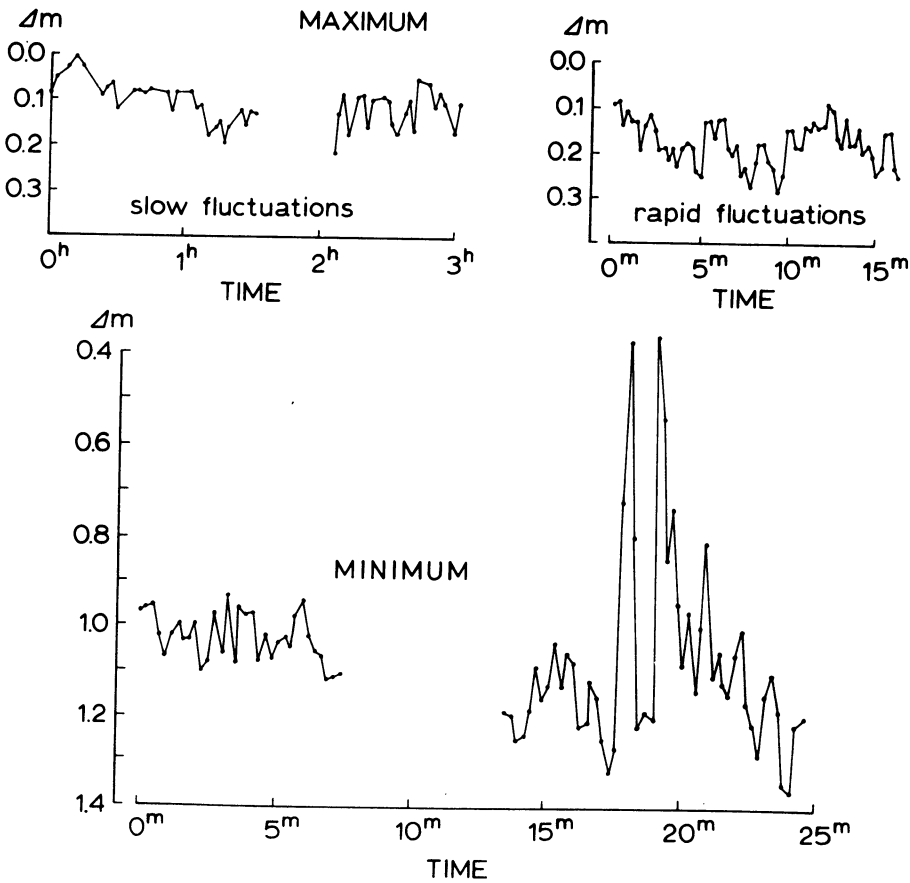

Fig. 2. Fragments of the light curve of RZ Psc.

https://doi.org/10.1017/S0074180900010172 Published online by Cambridge University Press

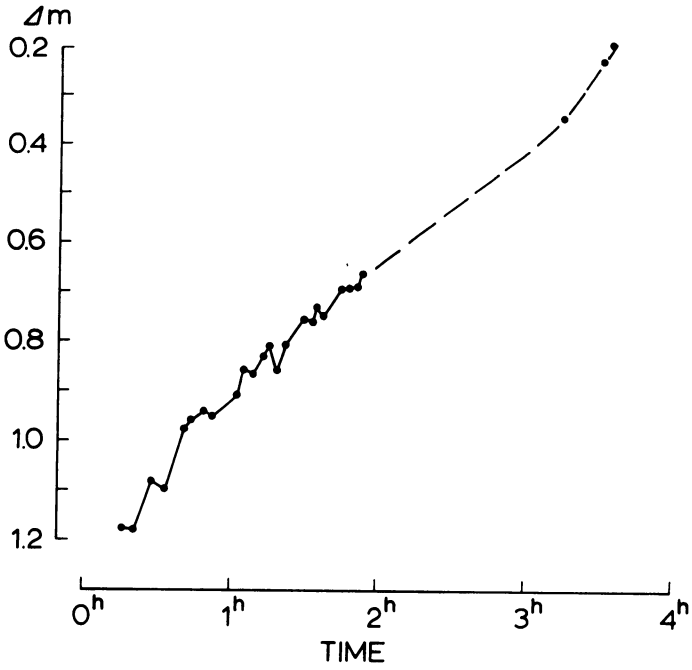

Fig. 3. Rising branch of RZ Psc.

DISCUSSION

W. Wenzel: What is the wavelength dependence of the light variation of PZ Psc?
A. F. Pugach: It seems that PZ Psc is getting bluer during minimum.

https://doi.org/10.1017/S0074180900010172 Published online by Cambridge University Press