FOUR NEW RED VARIABLES

On the photographs taken with four cameras of focal lengths 20, 30, 50 and 85 cm, the following four red variables were found. The emulsion was Tri-X and the brightness very close to visual magnitude was obtained with green-yellow filter. The positions of the stars are as follows:

Star	R.A. (1950.0)	Decl.
No. 1	$6^h30^m47^s$	$+28°19\!.6$
No. 2	19 49 43	+43 30.0
No. 3	19 50 0	+44 6.7
No. 4	20 53 53	+23 44.7 = BD + $23°4183$

(Star No.1) On more than 540 photographs taken in 1977 through 1982 with f50 and 85 cm cameras, the star was found to be probably SRa type with a period of 188^d. The range was $11^m.9-13^m.1$(v) so far. The variation is well expressed by the following elements:

$$\text{Max.} = \text{J.D.}\ 244\ 3490 + 188^d \cdot \text{E.}$$

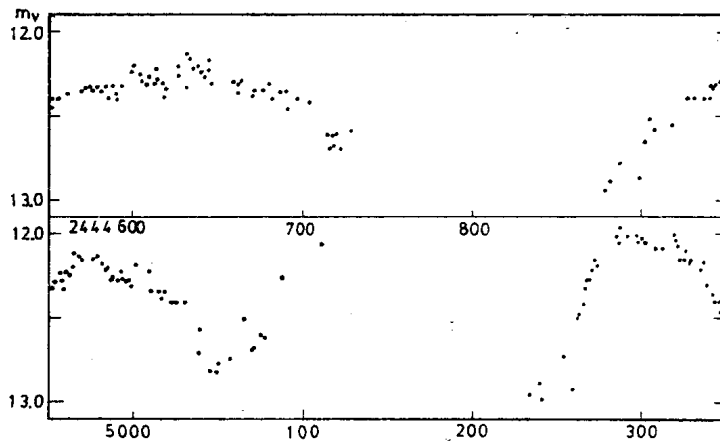The light variation in the recent years is shown in Figure 1.

Figure 1. Light variation of star No. 1

(Star No. 2) On about 450 photographs taken in 1976 through 1983 centered at δ Cygni, the star was found to be SRa type having fairly regular variation. The range was $10^m.3-11^m.5$(v). The maxima were well expressed by the following elements with O-C's less than 10 days:

$$\text{Max.} = \text{J.D. } 244\ 2910 + 119^d.3 \cdot \text{E.}$$

The light variation only in the recent years is shown in Fig. 2.
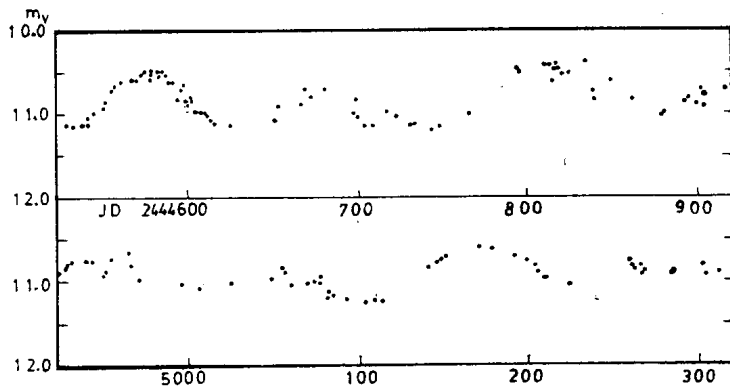

Figure 2. Light variation of star No. 2

(Star No. 3) On the same photographs as of No. 2, the star was found to be probably SRa type with the range of $11^m.0-12^m.5$(v). The periodicity became sometimes irregular, but the overall variation is generally expressed by the following elements:

$$\text{Max.} = \text{J.D. } 244\ 3640 + 146^d \cdot \text{E.}$$

The light variation in the recent years is shown in Figure 3.
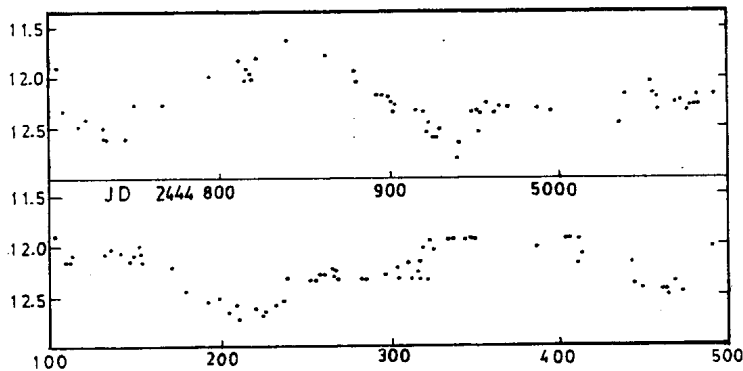

Figure 3. Light variation of star No. 3

(Star No. 4 = B.D. + $23^{o}4183$) On more than 300 photographs taken with the
f30 cm camera in 1975 through 1982 centered at 31 Vulpeculae, the star was
found to be probably SRa or SRb type. The amplitude was $10^{m}.3-11^{m}.4$(v) so far.
The variation was fairly regular in some years, but not apparent in some years
as in 1977 and 1978. The variation is generally expressed by the following
elements:

$$Max. = J.D. \ 244 \ 2775 + 116^{d}.E.$$

The light variation is shown in Figure 4.
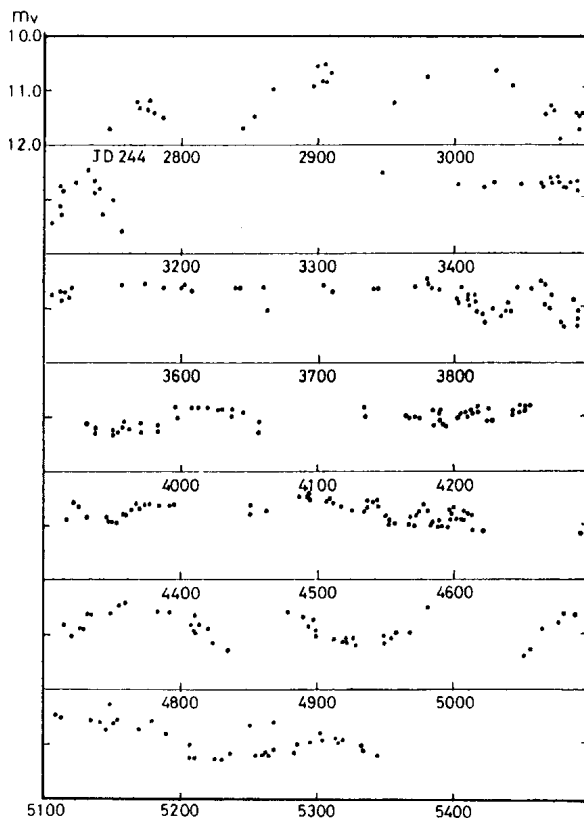

Figure 4. Light variation of star No. 4 (B.D.+$23^{o}4183$)
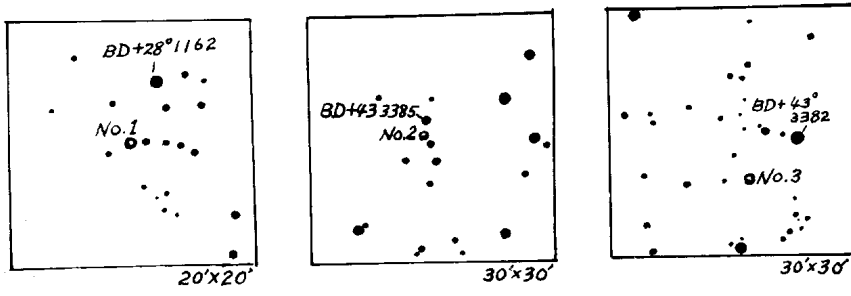
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Figure 5. Finding chart of star No. 1, No. 2 and No. 3 .

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