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UNUSUAL "RED" FLARE ON THE STAR T 231 = AZ Ori

Synchronous UBV observations of stellar flares in the Pleiades and Orion regions were carried out in Byurakan (Armenia, USSR) and Abastumani (Georgia, USSR) Astrophysical Observatories between 1979 and 1981. The results of these simultaneous photographic observations, obtained with three wide-angle telescopes, are published in the papers by Mirzoyan et al. (1981 and 1983) where the details about the method of these observations (photographic plates and filters used) and some other data can also be found.

The observations showed (Mirzoyan et al., 1981, 1983) that the colorimetric characteristics of flares both on the flare stars in clusters and associations and on the UV Ceti type flare stars in the solar vicinity were almost the same. Generally, in both cases the following inequality exists for the amplitudes  $\Delta U$ ,  $\Delta B$  and  $\Delta V$  :

$$\Delta U > \Delta B > \Delta V .$$

During our synchronous colorimetric observations, however, an unusual flare was detected on the star T 231 with very red colours. In this case a reverse inequality was noticed:

$$\Delta U < \Delta B < \Delta V .$$

The details of this flare are given in Table I, where the following data are listed:

1. the universal time for each measurement (image);
- 2.-4. the amplitudes  $\Delta U$ ,  $\Delta B$  and  $\Delta V$ ;
- 5.-6. the  $(U-B)_+$  and  $(B-V)_+$  colour indices of the flare, calculated by means of the formulae given by Mirzoyan (1966);

The data in Table 1 show that the total duration of this flare was about four hours, and the  $(U-B)_+$  and  $(B-V)_+$  colours of the flare were redder all the time than the colours of the star T 231 = AZ Ori itself, in normal state ( $B-V = +1^m.1$ ,  $U-B = +0^m.5$ ; Mirzoyan et al., 1983). These results are presented in Figure 1.

Table I

The "red" flare on the star T231 = AZ Ori

U.T.	$\Delta U$	$\Delta B$	$\Delta V$	$(U-B)_+$	$(B-V)_+$
22 <sup>h</sup> 02 <sup>m</sup> 5	1 <sup>m</sup> .4	1 <sup>m</sup> .5	1 <sup>m</sup> .7	0 <sup>m</sup> .6	1 <sup>m</sup> .4
08.5	1.4	1.5	1.7	0.6	1.4
14.5	1.2	1.2	1.6	0.5	1.7
20.5	1.1	1.5	1.9	1.0	1.7
26.5	0.7	1.2	1.3	1.3	1.3
32.5	0.7	1.2	1.7	1.3	1.8
38.5	0.7	1.1	1.2	1.3	1.3
44.5	0.6	0.9	1.6	1.1	2.2
56.5	-	1.2	-	-	-
23 02.5	0.9	1.0	-	1.0	-
08.5	0.8	0.9	1.8	0.6	2.4
14.5	0.9	0.9	1.4	0.5	1.9
20.5	0.6	1.0	1.8	1.3	2.3
26.5	0.7	1.2	1.4	1.3	1.4
32.5	0.5	1.0	1.2	1.5	1.5
38.5	0.5	0.9	1.2	1.3	1.6
44.5	0.5	-	1.2	-	-
00 02.5	0.9	1.4	-	1.2	-
08.5	1.3	1.2	-	0.3	-
14.5	1.0	1.1	-	0.7	-
20.5	0.7	1.2	-	1.3	-
26.5	0.5	1.4	-	2.1	-
32.5	0.6	1.1	-	1.5	-
38.5	0.6	1.0	-	1.2	-
44.5	-	1.2	-	-	-
01 02.5	0.9	1.4	-	1.2	-
08.5	1.3	1.2	-	0.3	-
14.5	1.0	1.1	-	0.7	-
20.5	0.7	1.2	-	1.3	-
26.5	0.5	1.4	-	2.1	-
32.5	0.6	1.1	-	1.5	-
38.5	0.6	1.0	-	1.2	-
44.5	-	1.2	-	-	-
56.5	1.1	1.1	-	0.5	-
02 02.5	0.6	0.9	-	1.1	-
08.5	0.9	0.9	-	0.5	-
14.5	0.7	1.0	-	1.0	-
20.5	0.7	1.0	-	1.0	-
26.5	0.2	0.9	-	-	-

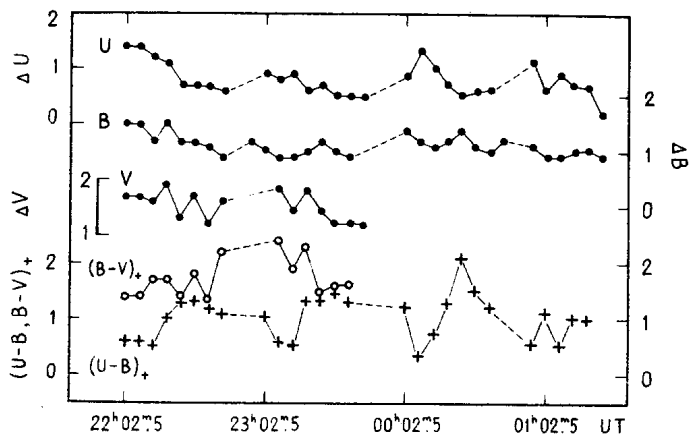


Figure 1. The light curves in the U, B, and V bands and the variations of the flare colours (circles:  $(U-B)_+$ ; crosses:  $(B-V)_+$ ), during the "red" flare on the star T 231 = AZ Ori. After  $00^h00^m$  (U.T.) the observations in the V-band were stopped (in Abastumani) because of weather conditions.

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