

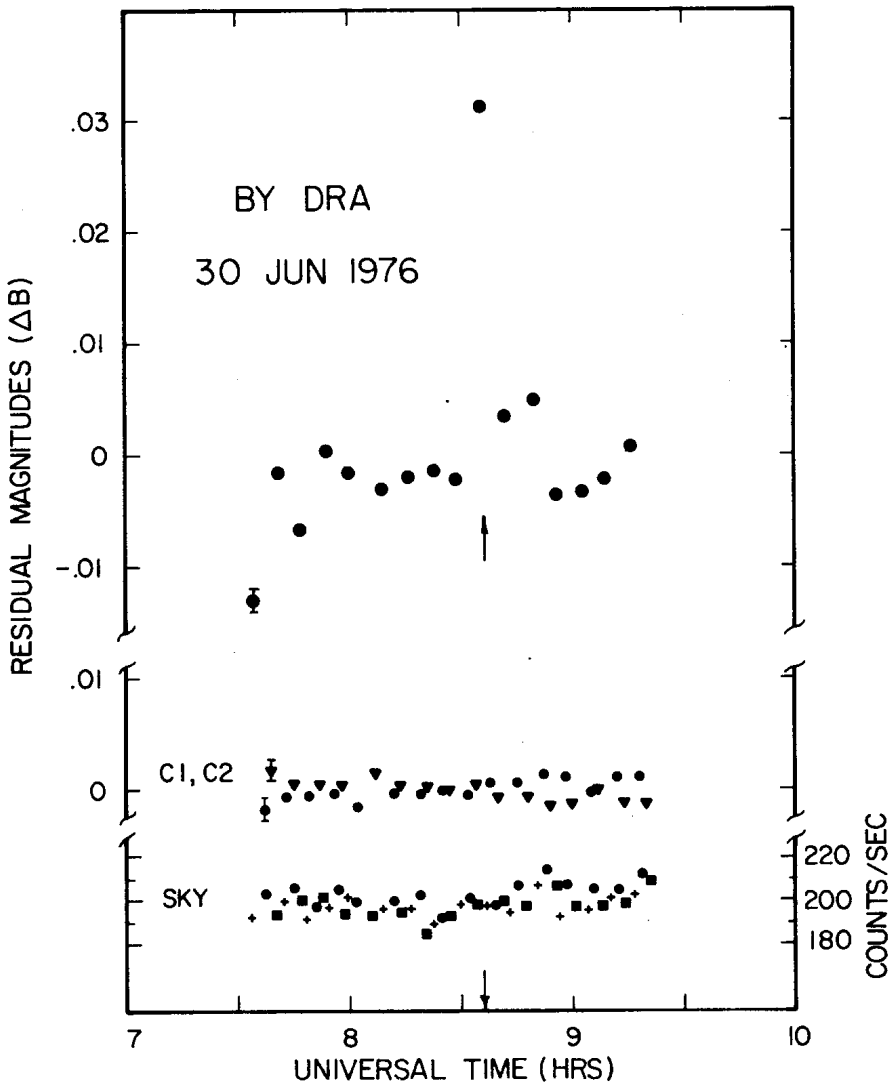
COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 1271

Konkoly Observatory
Budapest
1977 April 25

A FLARE EVENT ON THE dM0e VARIABLE BY DRACONIS

As part on an ongoing program to obtain a body of high quality photometric data on the flare star BY Draconis, a series of observations was undertaken during the past year (1976) in order to time-resolve the reported light variations. The behavior of BY Dra has been interpreted in terms of a binary system (non-eclipsing) wherein an apparent rotational modulation of the integrated luminosity has been attributed to the existence of starspots on one of the components, after Vogt (1975). Thus, it is of considerable interest to determine whether further observations support such a hypothesis and indeed verify the existence of starspots. During the course of obtaining additional observations, a prominent flare was observed on BY Dra, the characteristics of which are described below.

The flare was observed while using the 91-cm telescope of the McDonald Observatory in conjunction with an uncooled 56 DVP photomultiplier operating in a pulse counting mode. Using the B filter of the standard Johnson UBV system, the method of collecting the data followed the conventions suggested by Andrews et al. (1969). Residual magnitudes (ΔB) were determined with respect to the mean of two established comparison stars (C1 = BD +51^o2410 ; C2 = BD +51^o2408) with consecutive measures being taken on each star and then the sky background. The observations, corrected for extinction, are shown in Figure 1, where the flare data is displaced above that of the two comparison stars for clarity of illustration. The sky backgrounds (in counts per sec) are also shown beneath the comparison stars. Each data point represents an average of three



15-sec integrations which was formed upon removing the appropriate sky background measure and the dark current of the photometer. The accuracy per data point is determined to be .002 mag. as estimated from the scatter in the residuals of the two comparison stars. A slight increase in the mean light of BY Dra is evident in the Figure as it was observed on the rising portion of its light curve. Other relevant data pertaining to the flare event is collected in Table I.

Table I
Summary of Flare Characteristics

Quantity (1)	Value (2)	Comments (3)
Date (1976)	June 30	
U.T. (max.)	08 ^h 36 ^m 0	Flare maximum
Duration (minutes)	~23	
P [†] (minutes)	0.285	
Δm_S (mag.)	0.031	Maximum amplitude
σ (mag.)	0.002	
Airmass, X	1.13	At flare maximum
Notes: $t_p = \int \Delta m dt$		Andrews et al. (1969)

Δm_S is the instrumental b magnitude

Although the time resolution of the flare is rather coarse, evidence for multiple structure can be seen in examining Figure 1. It is also of interest to note the possible precursor to the main flare which occurred some 51 minutes earlier and attained an amplitude of ~ 0.007 mag. above the quiescent level.

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References:

- Andrews, A.D., Chugainov, P.F., Gershberg, R.E., and Oskanian,
V.S. 1969, I.V.B.S. No. 326.
Vogt, S.S. 1975, Ap.J., 199, 418.