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CONFIRMATION OF FLARE ACTIVITY ON G9-8 BY PHOTOELECTRIC PHOTOMETRY

The nearby common proper motion stars G9-8 and G40-26 (Giclas et al. 1971) were discovered photographically to be M dwarf flare stars by Haro et al. (1975). They were subsequently named CU Cnc and CV Cnc. At least the brighter star CU Cnc shows the Hα line in emission. The magnitude difference between these two stars is $\Delta V=1.39$, and the fainter component of the pair is slightly redder than the brighter one. At a separation of about 12 arc sec it was possible for us to isolate the brighter star for photoelectric high speed photometry, using a 14 arc sec diaphragm.

TABLE I

Photoelectric Flare Monitoring of G9-8

Date(UT)	Start(UT)	End(UT)	Obs. time (sec)
14 November 1981	11:04:31	11:12:46	495
14 November 1981	11:14:52	11:43:40	1728
14 November 1981	11:44:52	12:04:31	1179
14 November 1981	12:05:52	12:19:22	810
16 November 1981	09:47:13	11:13:01	5148
16 November 1981	11:14:22	11:52:28	2286

Total effective monitoring time = 11646 seconds
= 3.235 hours

We monitored CU Cnc = G9-8 on 14 and 16 November 1981 UT with the 2.1 m Struve reflector at McDonald Observatory. The detailed observing log is given in Table I. A high speed photometer controlled by a NOVA minicomputer (Nather 1973) was attached to the telescope, and one second integrations were taken succesively through eight filters. In each filter the time resolution was nine seconds, due to the fixed time needed for filter changes by the stepping motor. The band-passes for which data are presented here were determined by the response function of the RCA C31034A photomultiplier and the transmission properties of the glass filters selected to approximate the UBVR system. Typical measurement accuracies at the one standard deviation level for the time series in each of the filters were 0.07 (U), 0.014 (B), 0.008 (V), and 0.004 (R).

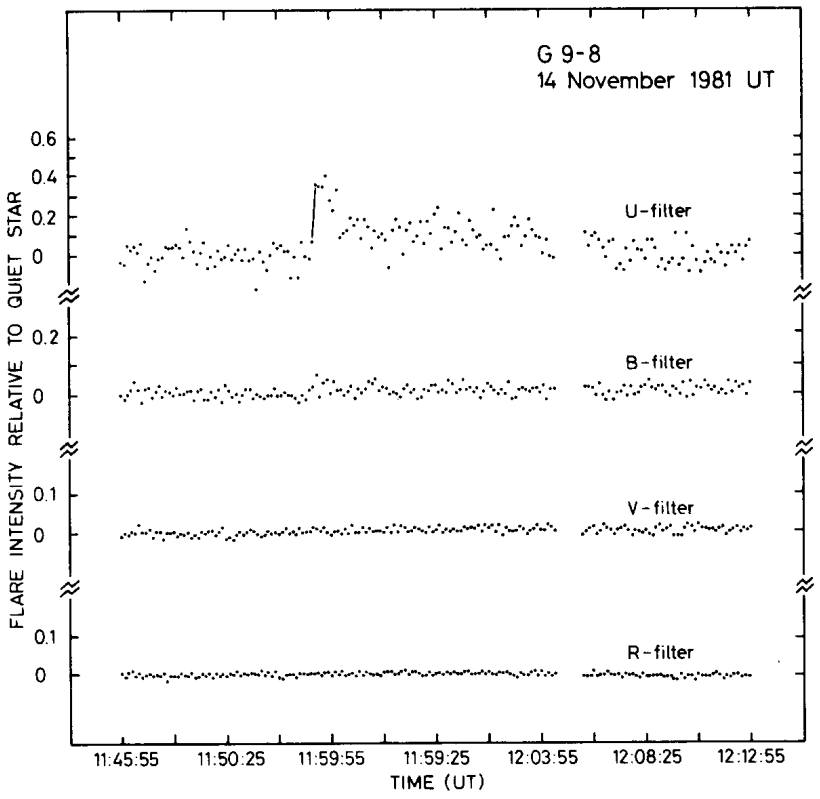

Figure 1

In 3.235 hours of effective monitoring time we detected one flare. It was distinctly recorded only in the U-filter at a peak amplitude of six standard deviations, but was marginally detected also in the B-filter. No flare was seen in V or R at an amplitude exceeding two standard deviations of the measurement noise (Figure 1). The flare had a quick rise towards maximum and decayed back to the preflare level over 15 minutes. This observation confirms the conclusion by Haro et al. (1975) that CU Cnc is a flare star, and represents the first photoelectric light curve of a flare on this star.

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