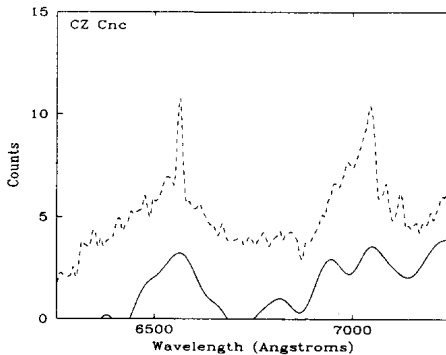


**CZ Cnc – A DWARF M FLARE STAR**

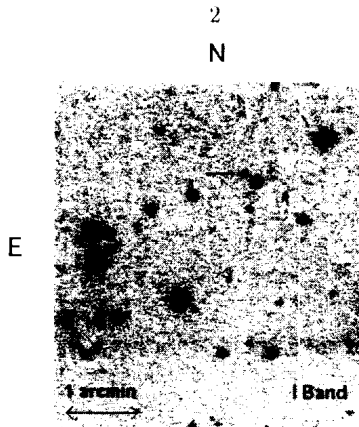
Lovas (1977) discovered an apparent 13.5 mag stellar object on a blue Schmidt plate taken in 1976. A subsequent Schmidt plate showed the object at 18.0 mag implying a decline by 4.5 mag in 80 min. On the Palomar Sky Survey plates only the red exposure shows a star at the position of CZ Cnc near the detection limit.

Schaefer (1990) obtained multicolor photometry of this faint red object:  $V=21.15$ ,  $B_V=1.86$ ,  $V-R=1.39$ ,  $V-I=3.86$ ,  $V-J=5.98$ ,  $V-H=6.59$  and  $V-K=6.92$ . He interpreted this object as a very low luminosity main-sequence star and derived  $M_V=16.1$  and a distance of 100 pc.

We have observed CZ Cnc with the CARELEC spectrograph at the 1.93 m telescope of the Observatoire de Haute-Provence (OHP, France). Low resolution spectra were acquired using a TK 512 CCD chip. We obtained two 30 min. long exposures on 1992 February 4.01 and 11.03 UT. Owing to its faintness and red colour, the star was only detected longwards of 6400 Å with a rather high noise level. The summed observation smoothed with a gaussian filter of  $\sigma = 30$  Å is shown in Fig. 1. For comparison we plot the spectrum of the dM3-5e flare star located in the error box of the 1978 October 6B  $\gamma$ -ray burst which had suffered a flare of  $\Delta m_B \approx 5.2$  mag (Greiner & Motch, 1994). The large TiO molecular bands are clearly seen in CZ Cnc and suggest a late M type star in agreement with the photometric colour indexes reported by Schaefer (1990). An accurate spectral classification would necessitate deeper observations at longer wavelengths.



**Figure 1:** Mean red spectrum of CZ Cnc smoothed with a gaussian filter of  $\sigma = 30$  Å (solid line). For comparison we show the spectrum of the dM3-5e flare star located in the error box of the 1978 October 6B  $\gamma$ -ray burst as measured with the same instrumentation. The large TiO molecular bands are clearly visible and classify the object as a late M star.



**Figure 2: A finding chart showing the position of CZ Cnc on a 10 min. long I band CCD exposure.**

In addition to the position determination of Kholopov et al. (1985) which corrected for the equinox error in Lovas (1977) we give in Fig. 2 a more detailed finding chart based on a 10 min I band CCD exposure taken on 1992 January 31.09 UT with the 1.2 m telescope at OHP.

Glaubitz (1992) has searched most of the available plates of Sonneberg Observatory archive (a total of 1092 taken between 1941 and 1991). The majority of these plates had a limiting magnitude of 14 mag (pg), and no further eruption was discovered.

The herewith presented evidence for CZ Cnc to be a dM flare star makes it the record holder in flare amplitude: 9.5 mag in blue. This is certainly only a lower limit (Greiner & Wenzel 1992) since 1) the exposure time of the plate (15 min.; Szeidl 1990) could have been longer than the time of CZ Cnc spent at maximum light, and 2) the discovery plate may not have covered the maximum of the flare.

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