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SPECTRAL VARIATION OF CH CYGNI IN THE NEAR INFRARED

The recent visual magnitude estimations of the symbiotic star CH Cyg reveal an important drop in brightness from February 5.5 UT to May 18.5 UT when the star was reaching its lowest brightness since 1926 (Garnavich and Mattei, 1988).

Figure 1 shows 2 spectra of CH Cyg obtained on 1987 September 13.89 UT and 1988 June 22.96 UT at the 193 cm telescope of the Haute Provence Observatory with a CCD detector (range 6570-10300 Å, dispersion 260 Å/mm). For comparison we give the spectrum of Omicron Peg, Al V spectral type, characterized by the stellar absorption hydrogen lines (Paschen series from P 11 at 8865 Å to P 16). The other absorptions are telluric bands of O<sub>2</sub> and H<sub>2</sub>O.

We note an important variation between the 2 spectra of CH Cyg: they both exhibit numerous and intense absorption bands of TiO, but on June 22.96, VO bands are also present.

In the figure are indicated the principal groups of these bands: TiO at 6714-7126-7590-8300-8452-8860 Å, VO at 7400-7900 Å. These different bands are currently used to classify the late-type stars: in particular, M stars classification is based upon their intensities (Sharpless, 1956; Mavridis, 1966; Wing, 1966; Albers, 1974; Turnshek et al., 1985; Schulte-Ladbeck, 1988).

From these studies, we tried to determine the spectral type of our 2 spectra mainly using the atlas of digital spectra of cool stars (Turnshek et al., 1985) established with a resolution similar to ours.

Spectrum obtained in 1987: TiO bands (at 8542 Å and 7589 Å (strong)) are present whereas VO bands are not detected which is typical of the M5 - M6 group (Mavridis, 1966). Our spectrum is similar to that of R Lyr classified M5 III (Turnshek et al., 1985).

Spectrum obtained in 1988: the VO bands at 7400 and 7900 Å, which are characteristic features of the M7 type (Turnshek et al., 1985) are very well visible. However our spectrum is similar to that of RU Her, classified M6.5 III.

The photoelectric color determinations are consistent with those of a standard M6 III star (Garnavich and Goldader, 1988). This result is in slight disagreement with our spectral classification.

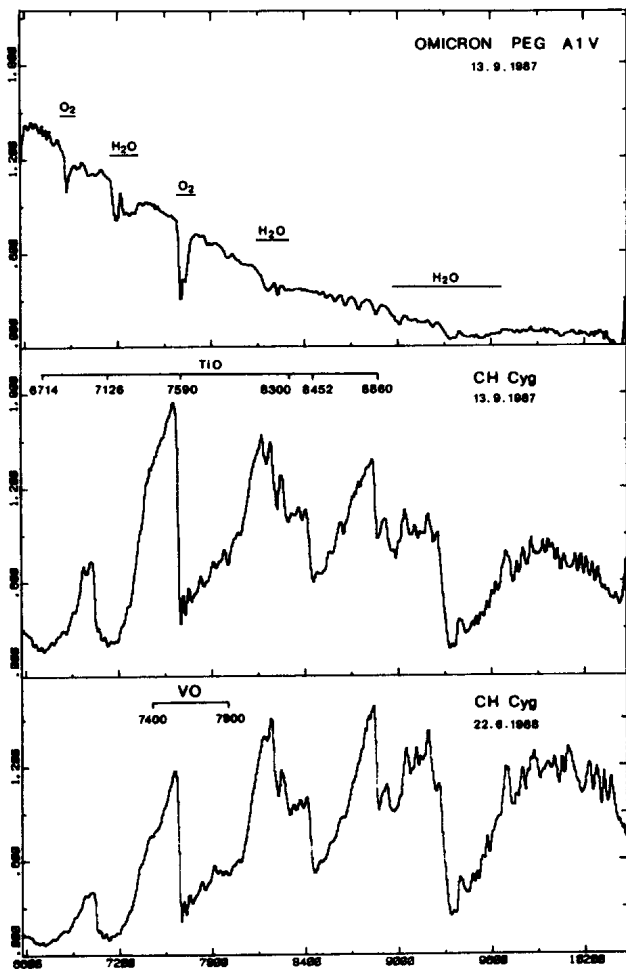


Figure 1

In June 1988, CH Cyg was in a quiet state: we observed no emissions in the near infrared region (see Figure 1); only H $\beta$  is visible as a faint emission on a spectrum taken in the blue region.

Finally we conclude to a typical spectrum of a M7 III star, in good agreement with the model comprising an M7 giant and a hot component proposed by Taylor et al. (1986).

It is a spectrum of a type later than that obtained in September 1987 (M5 III), about 2 years after an active phase (Taylor et al., 1986; Mikolajewski and Wikierski, 1986; Hack et al., 1988).

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