

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

Number 1314

Konkoly Observatory
Budapest
1977 July 29

SPECTRAL CHANGES IN V1331 CYGNI (LkH α 120)*

This unusual T Tauri star was included in a study of mass loss from T Tauri stars by Kuhl (Ap.J. 140, 1409, 1964). He used 16 Å/mm Lick spectra, in the case of V1331 Cygni unwidened because of the faintness of the star. The spectrum of V1331 Cygni was described as essentially continuous, with superposed emission lines. The early Balmer lines of hydrogen and the K line of ionized calcium showed P Cygni structure. Emission at the CaII H line was quenched by the shortward-shifted absorption component of H ϵ . Among other emission lines were found the 4063 Å and 4132 Å lines of neutral iron typical of T Tauri stars. No stellar absorption features were observed.

From the strength and displacement of the H γ , H δ and K absorption components Kuhl estimated the mass loss from V1331 Cygni to be of the order of $6 \times 10^{-7} M_{\odot}$ per year. This is a considerably higher value than found for any other T Tauri star. In addition, Kuhl derived a mass of the star of about $4 M_{\odot}$, also this higher than the masses of ordinary T Tauri stars. Although it should be remarked that the precise values are dependent on certain assumptions made by Kuhl for want of adequate data, they clearly put V1331 Cygni in a class of its own among the more thoroughly studied T Tauri stars.

In August, 1976, two spectrograms of V1331 Cygni were obtained with the 1.52 m telescope of l'Observatoire de Haute-Provence equipped with the PEDISCOU (PETite DISpersion COUdé) spectrograph and an RCA two-stage image tube. The reciprocal dispersion of these spectrograms is about 100 Å/mm over the wavelength region 3700-5400 Å.

*Based on observations made at l'Observatoire de Haute-Provence (CNRS).

It was noted by Kuhl that the spectrum of V1331 Cygni had shown no appreciable changes over a period of about four years. In contrast to this the 1976 spectrograms show a marked weakening of the emission lines, and a strengthening of the absorption components of the hydrogen lines, when compared to the spectrogram reproduced by Kuhl. Thus, no emission is seen at H γ and H δ . The FeI 4063 Å line is also absent, and may even be weakly in absorption, whereas its companion line at 4132 Å is present in emission, although apparently weaker than in Kuhl's spectrum. The other lines of this FeI multiplet (43) seem all to be in absorption, as are a number of other lines, notably CaI 4227 Å and several TiII lines.

The similarities between the earlier spectrograms of V1331 Cygni and the only existing spectrogram of V1057 Cygni before its FU Orionis-like brightening in 1969-70 have been noted previously (Welin, *Astron. Astroph.* 49, 145, 1976). There is an interesting possibility that the spectral changes now observed in V1331 Cygni may be signs of an imminent flare-up of this star. However, occasional checks of the brightness of V1331 Cygni during the last year have so far not revealed any variations in excess of those already known.

GUNNAR WELIN
Astronomiska Observatoriet
Box 515
S-751 20 Uppsala, Sweden