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CONTINUING H α SPECTROSCOPY OF CH CYGNI

The symbiotic star CH Cygni has been spectroscopically monitored at Ritter Observatory for several years. Our most recent report (Bopp 1990) discussed spectroscopy obtained between 1986 and June 1990, emphasizing data on the H α profile acquired with our echelle spectrograph (resolution 0.3 Å). During 1986-1990 CH Cyg was in a quiescent state, declining in brightness to $V=9.2$ in the first part of 1990. The behavior of the H α emission line over this interval was characterized by a general decrease in equivalent width (EW), as well as a narrowing of the profile (see also Bode *et al.* 1991).

In this report we present H α data obtained between August 1990 and May 1992, noting in particular a dramatic increase in H α EW and the reappearance of He I 6678 Å emission in the May 1992 data. This confirms the sudden increase in the activity level of CH Cyg originally reported by Skopal *et al.* (1992).

Most of our recent spectroscopic data on CH Cyg has been obtained with our Low Dispersion Spectrograph (LDS), which provides spectral resolutions of 1.2 to 6 Å depending on the grating used. The LDS uses a conventional optical layout, mounted on a Newport Corporation optical table. The spectrograph is coupled to the telescope focal plane by 20 meters of optical fiber; calibration flats, Neon comparisons, and starlight all follow the same optical path. The detector is a Wright Instruments CCD system with an EEV 385 x 578 pixel chip. At the 1.2 Å resolution used for the CH Cyg observations, the spectral coverage was about 350 Å; typical integration times were 10-20 minutes.

To quantify changes in H α , we measured the line intensity and EW with respect to a local pseudo-continuum, and present results in Table 1. As we have previously noted, there appear to be 20-30% changes in both EW and intensity of H α in CH Cyg that occur on a

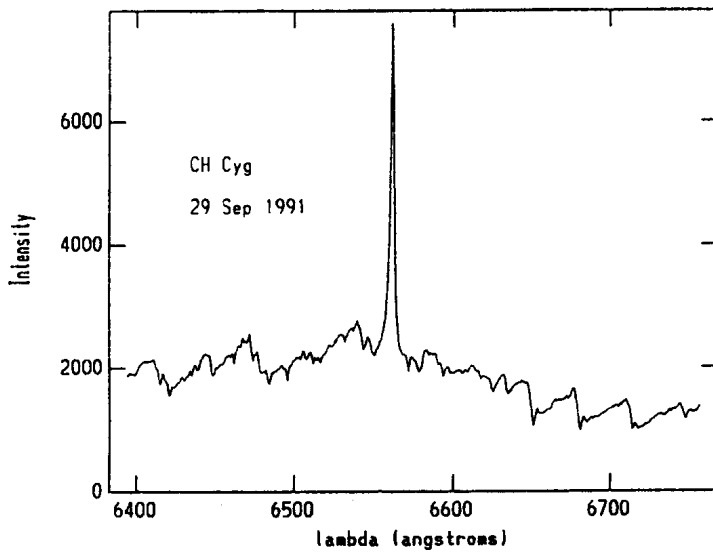


Figure 1: The red region of CH Cyg on 29 September 1991, showing a relatively weak H α emission feature.

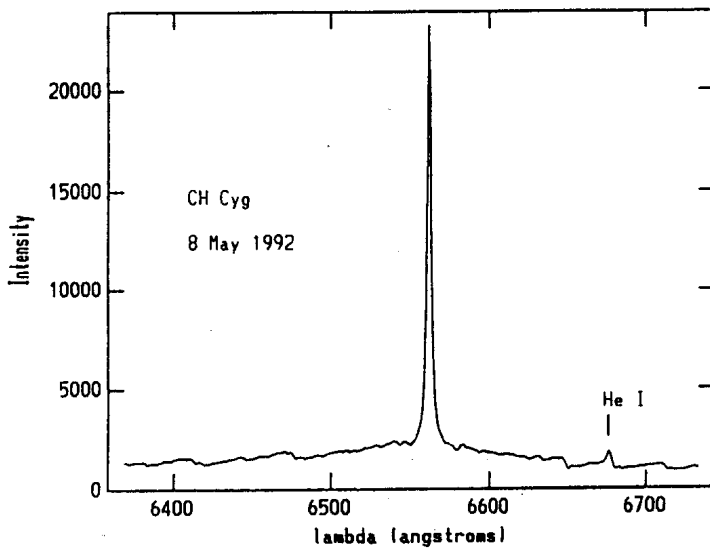


Figure 2: H α in CH Cyg in May 1992, showing the enhanced emission line as well as He I 6678 Å emission.

Table 1

H α Observations of CH Cyg

UT Date	EW(\AA)	Intensity (x continuum)
25 Aug. 1990	20.4	6.3
5 Sep. 1990	26.1	8.0
21 Sep. 1991	11.7	4.8
29 Sep. 1991	7.7	3.2
14 Nov. 1991	12.2	4.7
8 May 1992	34.6	10.4

timescale of a few days or less. In September 1991, we recorded the weakest H α in several years of monitoring, with an intensity only three times that of the continuum (Figure 1). No other emission lines were seen in this wavelength region during 1990-91.

CCD spectra from May 1992 (Figure 2) show dramatic spectral changes, and confirm the announcement by Skopal *et al.* (1992) that an outburst has begun. The H α line is much more intense and broader; the EW has increased by a factor of three, and the He I 6678 \AA line has appeared in emission. While not obvious on Figure 2, the He I line is considerably broader than the instrumental resolution, with a full width of nearly 300 km s⁻¹. Continued spectroscopic monitoring of CH Cyg through its outburst is planned.

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