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SPECTROSCOPY OF FAINT CATACLYSMIC VARIABLES I

TV Corvi (Tombaugh CV, 1217-18, Crv1, Nova Corvi 1931)

This star was originally discovered by C. Tombaugh in 1931 during his search leading to the discovery of the planet Pluto. It had laid undisturbed for 60 years until it was rediscovered by Levy et al. (1990). They showed that TV Crv has a large outburst amplitude and they also present spectra at outburst as well as minimum light photometric data. The latter showed no periodic modulations.

Figure 1 shows our unfluxed spectrum obtained for TV Crv. AAVSO data (Mattei 1993) shows no indication of an outburst for $-12/+30$ days from our observation, so we assume it was made when TV Crv was near minimum. As the data are not fluxed, we cannot comment on the nature of the slope of the continuum, however, the spectrum seems to be typical of a low mass transfer rate system. Emission lines of hydrogen and helium are seen. The apparent emission features near 5570Å and 6300Å are due to incomplete night sky line subtraction.

The featureless red continuum shows no evidence of a secondary star. The large outburst amplitude for TV Crv ($\sim$8 mags; Levy et al. 1990) suggests that this star is a tremendous outburst amplitude dwarf nova (TOAD). All confirmed TOADs known to date have measured orbital periods which are $\leq$2.5 hrs (Howell et al. 1994). Thus, it was likely, given the probable low mass transfer rate and the large outburst amplitude, that TV Crv has a $\leq$2.5 hr orbital period. Recent high-speed photometry of TV Crv during its June 1994 outburst shows superhumps with a period near 1.6 hrs (Howell et al. 1995).

AH Eridani

This star is likely to be a DQ Her system with a spin period of 42 minutes (Szkody et al. 1989) and the orbital period is still unknown. There is possible confirmation of this period in the X-ray range from ROSAT observations (Szkody et al., 1993). Szkody (1987) published a spectrum of AH Eri covering the wavelengths from 3400 to 5400Å. Her spectrum contained strong emission lines of H and He. Our spectrum, shown in Figure 2, is similar to Szkody's but has a wavelength coverage from 4000-9000Å. It also shows strong emission lines due to H and He. There are indications of additional weaker emission lines (Fe II) throughout the spectrum. The flat continuum shape from red to blue is consistent with AH Eri having little to no accretion disk. Since the Balmer decrement is flat, the optical extinction is not a likely contribution to the redness of the continuum. Despite the possible DQ Her status, HeII is not detected.

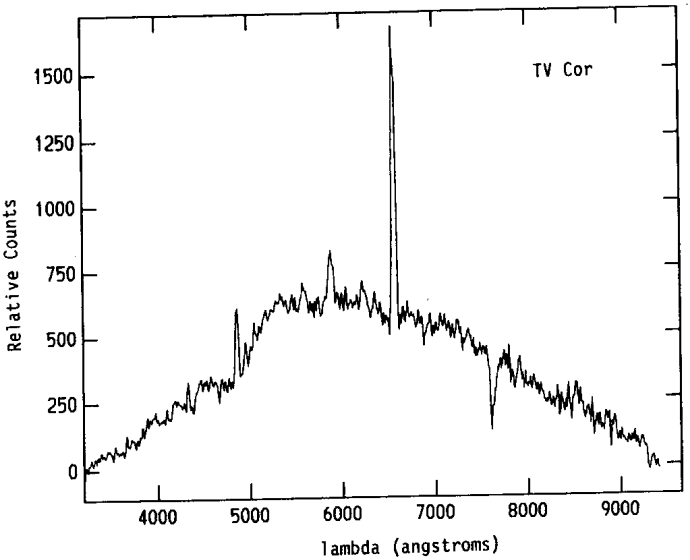

Figure 1. Unfluxed spectrum of TV Crv taken with the INT on La Palma.

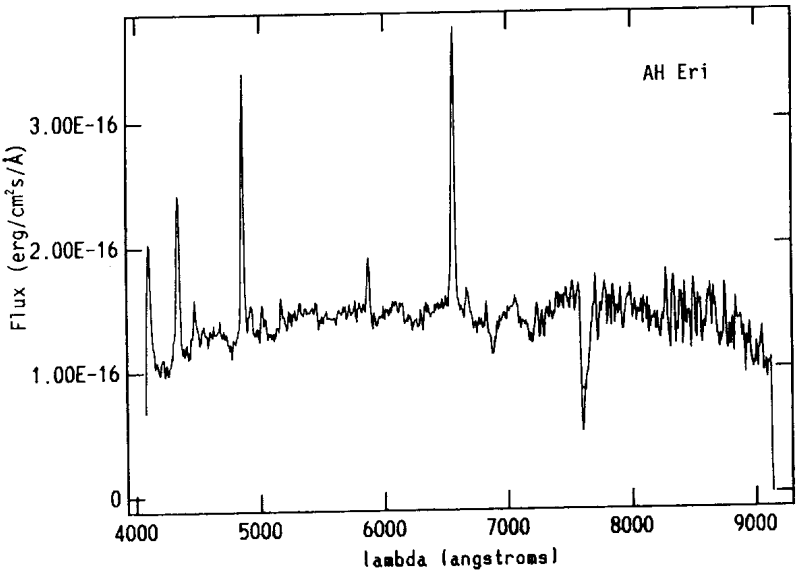

Figure 2. MMT spectrum of AH Eri.

The red spectrum shows clear evidence for TiO bandheads near 5900Å, 6200Å, 6600Å, and 7000Å degrading to the red. Using K and M star templates observed during our run, we performed a χ^2 test on the difference between each template and AH Eri over the wavelength range of 5000Å to 9000Å. We found a best fit match for the TiO bands to be an M3-M5 star. This spectral type usually implies a short orbital period ($\leq$3 hrs). The data are very noisy beyond 8000Å.

Observations reported here were made at the Multiple-Mirror Telescope and at the INT on La Palma.

Table 1. Observing log

Star	UT Date	UT Start	Int. Time	Spectral Resolution	V[a)]
TV Crv	1993 Mar 27	01:55	3072 sec	6Å	–
AH Eri	1992 Sep 02	10:35	1800 sec	15Å	18.5

[a)] V magnitude derived from numerical filter convolutions of the spectra.

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