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H α OBSERVATIONS OF THE RS CVN BINARY HR 7275 (V1762 CYG)

HR 7275 (V1762 Cyg, HD 179094) is an RS CVn binary with an orbital period of 28.6 days. Extensive photometry of HR 7275 (Seeds and Nations 1986, Nations and Seeds 1986) shows the star to have a highly variable amplitude, with changes evident on a timescale of one orbital cycle or less. An average photometric period of 27.78 days has been derived, but this value shows variability as well. A recent spectroscopic study of the H α profile in HR 7275 by Eker (1989) reports that maximum emission occurred during photometric minimum for one orbital cycle in June/July 1984.

As part of a spectroscopic monitoring program of active chromosphere stars at Ritter Observatory, we observed HR 7275 in 1987 and 1988. We obtained 20 Reticon scans of the H α region with spectral resolution 0.3 Å and signal to noise ratio about 50:1. On all the scans, H α is seen as an absorption feature. The equivalent width (EW) of the feature is always lower (weaker) than what is seen in ordinary, inactive K1 III stars, and is variable by nearly a factor of two, indicating that the line is partly filled by variable emission. In contrast to the results reported by Eker (1989), we find no correlation of H α EW with orbital phase (Figure 1). Since our observations extend over several rotational

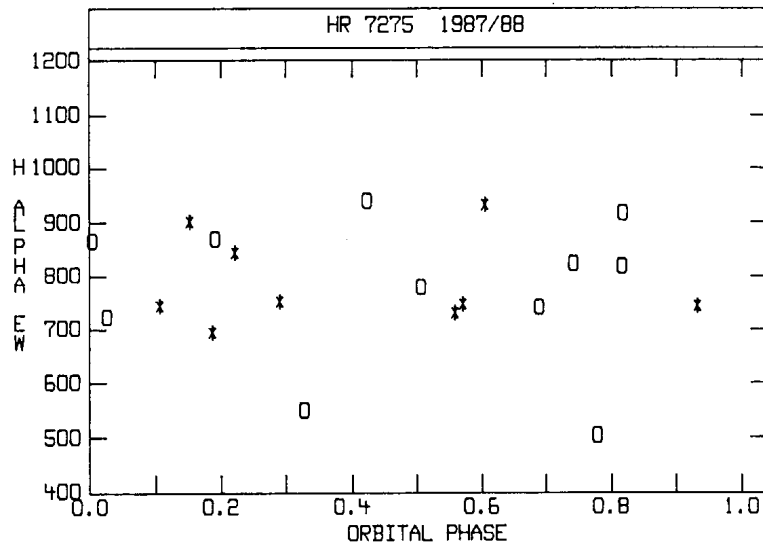


Figure 1: The H α EW of HR 7275 in mÅ plotted versus orbital phase (Eker 1989). Data from 1987 are indicated by open circles and from 1988 by asterisks.

TABLE 1

Radial Velocities of HR 7275

HJD - 2,447,000	V_r (km s $^{-1}$)
332.8141	-35.5
343.7598	+32.9
344.7417	+37.4
345.7522	+41.8
347.7168	+43.7
355.7221	-12.8
356.7318	-17.9
394.6311	-13.1
399.6491	+27.4
403.5994	+45.1
412.5718	-8.3
430.5464	+40.7

and orbital cycles, this presumably is a confirmation of the photometric behavior that indicates that activity on HR 7275 is strongly variable on timescales less than a month.

Examination of Figure 1 shows that the H α feature usually has an EW of approximately 800 mÅ, with variations of $\pm 10\%$. However, two observations from 1987, at phases 0.33 and 0.78, show an EW of only about 500 mÅ. This abrupt weakening of the line suggests a flare-like event as the cause.

Finally, Reticon data obtained during 1988 was used to derive radial velocities by cross-correlation with α Boo (Bopp and Dempsey 1989). The resulting velocities (with precision 1 km s⁻¹ or better) are listed in Table 1. A least squares orbital solution using these data, along with the velocity measures given by Young (1944) and Eker (1989), confirm Eker's revised orbital elements: the orbit is found to be circular with a period of 28.5895 days.

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