CCD spectroscopy of the W Serpentis binaries KX And and RX Cas

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(Not reviewed)

Abstract: Initial results are presented from a study of $H\gamma$ profiles in the two interacting binaries KX And and RX Cas of W Serpentis type. The used CCD spectra with a resolution of 0.13Å/px were obtained with the 2.2m telescope and the Coudé spectrograph at the German-Spanish Astronomical Center at Calar Alto/Spain.

KX And. This star is probably a non-eclipsing member of the W Serpentis type interactive binaries and has a period of P=38.908 days. Our seven spectra of KX And were obtained at phase 0.54 – 0.75. The P Cyg profiles of the $H\gamma$ line during our observations indicate an expanding shell. The asymetry becomes blue-sided at phase 0.67 and increases thereafter. This points toward a strong outflow of matter in the vicinity of the $L3$ point.

RX Cas. According to the model of Andersen et al. (1988) the primary is a mid-B type star with $M = 5.8 M_{\odot}$ and $R = 2.5 R_{\odot}$. The star is completely obscured by a geometrically and optically thick disk, which is supplied by mass transfer from the other component. The secondary is a K1 giant with $M = 1.8 M_{\odot}$ and $R = 23.5 R_{\odot}$ and fills out his critical Roche lobe. Radiative and geometrical properties of the disk are variable and its structure is probably not homogenous.

Five spectra of RX Cas were obtained during the primary eclipse (phase 0.95 – 0.19). The observed double-peak emission is seen only after the eclipse with a separation of ≈250km/s peak-to-peak, while during the eclipse an asymetric line profile can be observed with a red-shifted emission always presented. Also, a central emission at ϕ = 0.94 should be noticed, probably originating in the vicinity of $L1$.

The observations of both systems indicate that we are dealing with *strongly* interacting binaries. Further observations are planned for better covering of phase.

References:

Andersen,J., Pavlovski,K., Piirola,V. 1988: Astron.Astrophys. submitted

* Visiting Astronomer, German-Spanish Astronomical Center, Calar Alto, operated by the Max-Planck-Institut für Astronomie Heidelberg jointly with the Spanish National Commision for Astronomy.

Space Science Reviews **50** (1989), 363.