SPECTROSCOPIC CCD STUDY OF THE TWO-DAY WN5+O8V BINARY CX CEP

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After CQ Cep, the system CX Cep has the shortest orbital period known among Galactic WR+O binaries. However, no definitive spectroscopic study is yet available for CX Cep, probably because of its relatively faint magnitude (B $\approx$ 13). We have therefore obtained and analyzed some 60 CCD spectra (3700-4900 Å, S/N $\simeq$ 100, 5 Å/2 pixels) in August and October 1987.

Phased radial velocities (RV) show circular orbits with emission and absorption lines generally moving in antiphase. The best estimate of the RV amplitudes are $K_{\rm WR} = 340 \pm 10$ km s^{-1} (mainly from NV 4603) and $K_{\rm O} = 240 \pm 15$ km s^{-1} (from Balmer and Pickering absorption lines). With orbital inclination 74° $\pm$ 5° from polarization observations (Shulte-Ladbeck and van der Hucht 1989, *Ap. J.*, **337**, 872) we find the masses $M_{\rm WR} = 20 \pm 5 M_\odot$ and $M_{\rm O} = 28 \pm 7 M_\odot$ and the orbital separation $a = 25 \pm 2 R_\odot$. With core radius $R_{\rm WN5} \sim 3 R_\odot$ and $R_{\rm O8V} \sim 9 R_\odot$, the system is therefore not in contact.

Nevertheless, the relatively close orbit does produce interaction effects as illustrated in the Figure. Phased equivalent widths of emission lines show that:

(a) NIV 4058 is reduced in strength at phase 0.5 (O star in front) probably by a simple eclipse effect of the NIV emitting part of the WR wind;
(b) NV 4603/19 is weaker at both phases 0.5 and 0.0 implying that much of the NV emission must arise between the two stars (via wind collision?);
(c) HeII 4686 (emission) is strongest near phase 0.4, when the O star is still approaching the observer (bow shock effect?).

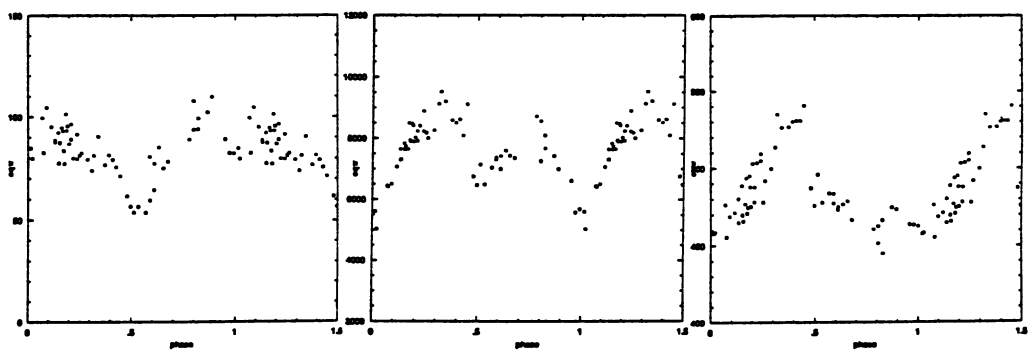

FIGURE. Equivalent width versus phase (WR behind at $\varphi = 0.5$) of emission lines NIV 4058, NV 4603/19 and HeII 4686 (left to right).

K. A. van der Hucht and B. Hidayat (eds.),
Wolf-Rayet Stars and Interrelations with Other Massive Stars in Galaxies, 256.