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D. C. Morton

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P-Cygni profiles in hot stars (summary only)

By D. C. Morton
Princeton University Observatory, Princeton, U.S.A.

Nearly complete spectral scans at 50 km s^{-1} resolution are now available for about 80 stars from the far-ultraviolet spectrometer on the Copernicus satellite telescope. The resonance lines of N v and other high ion states in all of the O stars and the hottest B supergiants have the characteristic P-Cygni profile, consisting of emission near the laboratory wavelength and a strong absorption on the short-wavelength edge. The absorption features have mean velocity shifts between 1000 and 2000 km s^{-1} with maximum velocities up to 2600 km s^{-1} at the edges, indicating that material is being ejected from the star. In some cases the absorption is a broad trough resulting from a wide distribution of velocities, while in other stars relatively narrow components are visible. Absorptions from the low lying excited levels of C III and N IV also have P-Cygni profiles in some stars. In the WC 8 Wolf-Rayet star γ^2 Vel, the ions with P-Cygni profiles include C II as well as C III, C IV and Si IV. Even the intersystem C III transition at 1908.734 Å has a weak absorption line at 1900.7 Å at the short-wavelength edge of a strong emission feature.

A plot of the Copernicus N v profile in ζ Oph (09.5 V) has been reproduced by Morton (1975). Both absorption components of the doublet are well defined, with an average displacement of -1420 km s^{-1}, while the short-wavelength edge corresponds to λ 1238.8 shifted to -1550 km s^{-1}. The P-Cygni lines in 29 C Ma (07f) will be described by McCluskey, Kondo & Morton (1975), and in ζ Pup (05f) by Morton (1975). An atlas of Copernicus scans from many stars showing velocity shifts is being prepared by Snow & Morton (1975).

References

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