

High resolution optical spectroscopy of Plaskett's star

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We present here the analysis of an extensive set of high resolution optical spectra of HD 47 129. We use a disentangling method to separate the individual spectra of each star. We derive a new orbital solution and discuss the spectral classification of both components. A Doppler tomography technique applied to the emission lines H alpha and He II 4686 yields a Doppler map that illustrates the wind interactions in the system. Finally, an atmosphere code is used to determine the different chemical abundances of the system components and the wind parameters.

HD 47 129 appears to be an O8 III/I + O7.5 III binary system in a post RLOF evolutionary stage, where matter has been transferred from the primary to the secondary star. The He overabundance of the secondary supports this scenario. In addition, the N overabundance and C underabundance of the primary component confirm previous results based on X-ray spectroscopy and indicate that the primary is an evolved massive star. Furthermore, the secondary star has a large rotational velocity that deforms its surface, leading to a non-uniform distribution in effective temperature. This could explain the variations in the equivalent widths of the secondary lines with phase. We suggest that the wind of the secondary star is confined near the equatorial plane because of its high rotational velocity, affecting the ram pressure equilibrium in the wind interaction zone.

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