

## Analysis of reflection effects in HS 2333+3927

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### Abstract

The results of photometric and spectroscopic observations of the pre-cataclysmic variable HS 2333+3927, which is a HW Vir binary system, are analyzed. The parameters of the sdB subdwarf companion ( $T_{\text{eff}} = 37\,500 \pm 500$  K,  $\log g = 5.7 \pm 0.05$ ) and the chemical composition of its atmosphere are refined using a spectrum of the binary system obtained at minimum brightness. Reflection effects can fully explain the observed brightness variations of HS 2333+3927, changes in the H I and He I line profiles, and distortions of the radial-velocity curve of the primary star. A new method for determining the component-mass ratios in HW Vir binaries, based on their radial-velocity curves and models of irradiated atmospheres, is proposed. The set of parameters obtained for the binary components corresponds to models of horizontal-branch sdB subdwarfs and main-sequence stars. © 2012 Pleiades Publishing, Ltd.

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