Asymmetric ejection of jets from the symbiotic prototype Z Andromedae

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Z And is considered as a prototype symbiotic star. The binary composes of a late-type, M4.5 III, giant and a white dwarf accreting from the giant’s wind on the 758-day orbit. From 2000 September, Z And started a series of outbursts with the main optical maxima in 2000 December, 2006 July and 2009 December. During the 2006 optical maximum, highly-collimated bipolar jets were detected for the first time. They were launched asymmetrically with respect to the reference wavelength of the spectral line. Their presence was transient, they disappeared by the end of 2006. During the following re-brightening, from the beginning of 2008 to its end, faint emission satellite components to the Hα and Hβ were observed again. The red component was enhanced relatively to its blue counterpart. During the recent 2009 major outburst, the mass ejection in the form of jet was indicated almost exclusively on the red side of the Hα line with velocities from +1000 (2009/10/01) to +1800 km s⁻¹ (2010/01/05). During the light maxima, our high-time-resolution photometry revealed irregular waves in the star’s brightness throughout a night (δm 0.06 mag), while in between the outbursts, they nearly disappeared. Evolution in the rapid photometric variability and asymmetric ejection of jets could be explained by a disruption of the inner parts of the disk ignited by radiation-induced warping of the disk.
Abstract. In this contribution we present our results of multicolour photometric and spectroscopic monitoring of the symbiotic prototype Z And during its latest active phases from 2006 to 2010. They were characterized by 2-3 mag re-brightening in the U passband and emergence of faint emission satellite components to the H-alpha and H-beta spectral lines. At the beginnings of these outbursts, the red satellite component was always enhanced relatively to its blue counterpart. During the recent 2009 major outburst, the mass ejection in the form of jet was indicated almost exclusively on the red side of the H-alpha line. During the light maxima, when the jets were ejected, our high-time-resolution photometry revealed irregular variations in V and R filters on the time-scale of hours and with a maximum brightness difference around of 0.065 mag, while in between the outbursts, they nearly disappeared. Evolution in the rapid photometric variability and asymmetric ejection of jets could be explained by a disruption of the inner parts of the disk ignited by radiation-induced warping of the disk.