

High time resolution multi-band photo-polarimetric observations of the binary millisecond redback pulsar J1023+0038 with the BTA

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Abstract

© Published under licence by IOP Publishing Ltd. We briefly report first results of high time resolution optical multi-band panoramic photo-polarimetric observations of the eclipsing binary millisecond redback pulsar J1023+0038 obtained in February 2017 with the 6 m BTA telescope. The time resolution was varied from 10 to 120 ms depending on observational mode. Our data show that the pulsar still remained in the low-mass X-ray binary stage, characterised by rapid flaring at time scales of 10-100 s with amplitudes of 0.2-0.5 mag. We resolved a fine structure of the flares at time scales of 0.1-10 s. The polarimetry at the time scale of 0.1 s shows no polarization with an upper limit of 2%-4% for the linear polarisation degree in flaring and quiet stages, while at a 10 minute scale averaging it is about 1.5% at 3σ significance. We shortly outline implications of the results.

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