# The quiescent optical light curve of XTE J2123–058

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## Abstract

We present optical photometry of the X-ray transient XTE J2123–058 during its quiescent state taken in 1999 and 2000. We fit the R-band light curves with a model which requires the ellipsoidal modulation and X-ray heating of the Roche-lobe filling secondary star, and an accretion disc bulge, i.e. where the gas stream impacts the accretion disc. The observed lack of light near phase 0.8 is interpreted as the eclipse of inner parts of the accretion disc by the bulge. This scenario is highly plausible given the high binary inclination of the system. Our fits allow us to constrain the size of the accretion disc to lie in the range 0.26–0.56 $R_{\rm L1}$ (68 percent confidence). Using the distance of 9.3 kpc and the X-ray flux inferred from the heated hemisphere of the companion, we obtain an unabsorbed X-ray luminosity of $1.2\times10^{33}$ erg s$^{-1}$ for XTE J2123–058 in quiescence. From the observed quiescent optical/IR colours we find that the power-law index (-1.4) for the spectral distribution of the accretion disc compares well with other quiescent X-ray transients.

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