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First simultaneous X-ray and optical observations of rapid variability of supercritical accretor SS433

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Abstract

We present results of first simultaneous optical and X-ray observations of peculiar binary system SS433. For the first time, chaotic variability of SS433 in the optical spectral band (R band) on time scales as small as tens of seconds was detected. We find that the X-ray flux of SS433 is delayed with respect to the optical emission by approximately 80 s. Such a delay can be interpreted as the travel time of mass accretion rate perturbations from the jet base to the observed X-ray emitting region. In this model, the length of the supercritical accretion disk funnel in SS433 is $\sim 10^{12}$ cm.

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Keywords

Accretion, accretion disks, Black hole physics, Instabilities, Stars: binaries:general, X-rays: general, X-rays: stars