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Correlation Between Orbital Modulation Parameters and X-ray Flux in Low-Mass X-ray Binary 4U 1820-30

The ultra-compact low mass X-ray binary 4U 1820-30 exhibits a ~3% orbital modulation in its X-ray light curve with a period of 685 seconds, along with a superorbital modulation where the flux varies by a factor of 2 over a period of ~170 days. Zdziarski et al.(2007), using early RXTE data, discovered a correlation between the amplitude of the orbital modulation and the accretion rate, suggesting that the superorbital modulation results from variations in mass transfer from the companion star. To further verify this dependence, we analyzed data collected by RXTE's PCA and ASM instruments, as well as recent observations from NICER and MAXI. We found a similar dependence not only in the RXTE data but also in the recent NICER and MAXI observations. We therefore confirm that the superorbital modulation of 4U 1820-30 is driven by mass transfer from the companion star.

Section

High Energy

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