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Properties of Double-Outbursts of MAXI J1834-021 In 2023

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The Galactic transient black hole candidate exhibited 'faint' outbursting activity for approximately 10 months following its discovery on February 05, 2023. We study the evolution of both the temporal and spectral properties of the source using archival data from the NICER and NuSTAR satellites. The outburst profiles and the nature of QPOs suggest that the source underwent a mini-outburst following the primary outburst. A monotonic evolution of low-frequency QPOs from higher to lower frequencies is observed, which is further analyzed using the propagating oscillatory shock (POS) model. This analysis suggests the presence of a receding shock. Spectral analysis using both phenomenological (a combined disk blackbody plus power-law) and physical (TCAF) models allowed us to understand the accretion flow dynamics of the source during its active phases in 2023. The combined NICER and NuSTAR spectral fit of the source on March 10, 2023, using the TCAF and kerbb models, is studied to understand the broadband nature of the source. These physical models also estimate intrinsic source parameters such as mass, spin, distance, and inclination angle. Throughout the entire outbursting phase, the source remained in a harder spectral state, with a clear dominance of nonthermal emissions from 'hot' Compton cloud. The 2023 outbursting activity of MAXI J1834-021 can be classified as a combination of double 'failed' outbursts, as no softer spectral states were observed.

Section

High Energy

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