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Using Fourier Resolved Spectroscopy to probe the X-ray variabilitty of the BHC Swift J1753.5-0127

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Swift J1753.5-0127 (J1753 hereafer) is a Low Mass X-ray Binariy (LMXB) hosting a Black Hole of ~3 solar masses (BHC), with a very short orbital period of around 3 hrs. The source exhibited an unusually long outburst cycle which lasted for approximately 12 years between 2005 and 2017 before returning to quiescence. We have obtained and analyzed multi-epoch series of archival data from XMM-Newton, NuStar, the Neils Gherels Observatory (previously known as Swift) to search for temporal and spectral variability along different phases of the long outburst. The outcome of the analysis reveals a rich spectra variability behavior. In addition, thanks to the brightness of the X-ray source, we have been able to perform Fourier Resolved Spectroscopy (FRS). The FRS spectra indicate the presence of a weak (though prominent) broad and variable Fe-like feature, around 6.4 keV, in the spectra of J1753. Interpretations of the spectral changes assuming a variable accretion flow to the BH and the weak presence of the iron line are discussed.

Topic

Compact and diffuse sources in galaxies and in the Galactic Center

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