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## Wideband spectral analysis of the brightest Black Hole X-ray Binary 4U 1543-47 in the 2021 Outburst

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4U 1543-47 is a galactic low-mass X-ray binary discovered in 1971. It has undergone five outbursts. The fifth outburst that happened in 2021 marks the source as the brightest X-ray binary source ever reported with a peak X-ray intensity of  $\sim 11$  Crab in 2-4 keV with *MAXI/GSC*. We aim for a comprehensive analysis of the wideband spectral characteristics of the source using *NICER*, *NuSTAR* and *AstroSat* Observations. We carried out phenomenological and reflection modelling using simultaneous reflection *NICER*-*NuSTAR* and *AstroSat* epochs. We found that the source was in HSS throughout, with a steep  $\Gamma$  due to a very small fraction ( $< 3\%$ ) of inverse-Comptonized photons. Reflection modelling reveals that the inclination of the system is between  $\sim 32^\circ$ - $40^\circ$ , disk possesses high ionization ( $\log \xi > 3$ ) and overabundance of iron ( $3.6$ - $10 A_{Fe\odot}$ ). We reported the presence of strong and dynamic absorption features in the spectra between  $\sim 8$ - $11$  keV throughout the outburst. This detection is the first of its kind for X-ray binaries. In addition, there exists a neutral absorption edge feature in the spectrum. We studied the evolution of the equivalent width of both components and found that these components follow the same trend with a delay of typical viscous timescale of 10-15 days. In this presentation, I plan to discuss the physical origin of the observed absorption feature and the accretion dynamics of 4U 1543-47 during the 2021 outburst.

### Presentation Type

Oral

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