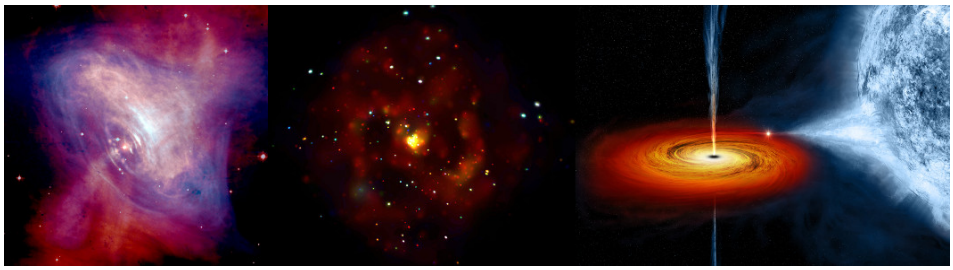

Contribution ID: **101** Type: **not specified**

A study of the 2018 and 2021 outbursts of XTE J1946+274 and it's phase dependent cyclotron line

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In the presence of strong magnetic fields, such as in the accretion columns of Neutron Stars, the electrons get quantized into circular orbits, and Cyclotron Resonant Scattering Feature (CRSF) is observed as absorption features in the X-ray spectrum as photons scatter off these electrons at the resonant energies. CRSF or cyclotron lines are the best diagnostic tools that we have to probe the magnetic fields of Neutron stars. It is, therefore, essential to study the dependence of the cyclotron line parameters on factors like luminosity, pulse-phase and time. XTE J1946+274 is a transient Be/X-ray binary showing several outbursts in the last three decades. It is an X-ray pulsar with a 15.7 s spin period with an eccentric ~170 day orbital period. It underwent outbursts in 1998, 2010, 2018 and most recently in 2021. It is also among the subset of sources that exhibit a CRSF in it's hard X-ray spectrum. We had previously investigated the pulse-phase dependence of the cyclotron line at ~38 keV using data from NuSTAR, which had observed it during the 2018 outburst. We further investigate the cyclotron line feature using data from Insight-HXMT and Astrosat of the 2018 outburst and Astrosat data of the 2021 outburst. The NuSTAR observation was made during the declining phase of the 2018 outburst, while Insight-HXMT and Astrosat observations are during the peak. We present a comparative study exploring the evolution of the spectral and temporal features of the 2018 and 2021 outbursts and the dependence of the cyclotron line parameters on pulse-phase and luminosity in this work.

Presentation Type

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