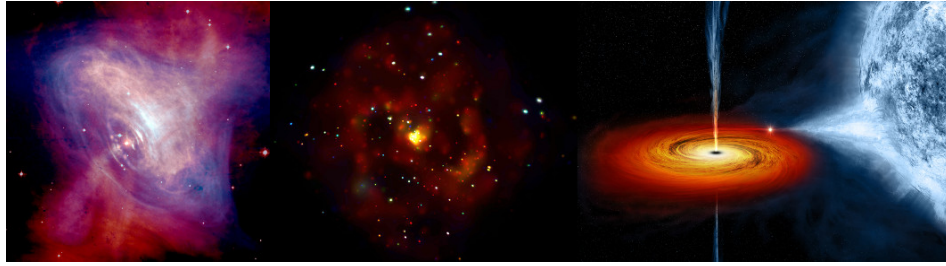


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In depth variability study of the Galactic transient XTE J1550-564 during the 2000 outburst

The evolution of time-lag and low frequency quasi-periodic oscillations (LFQPOs) in outbursting black hole sources can be explained by the systematic drifting of the outer boundary of the Compton cloud during rising and declining phases of the outburst. We study the fast variability properties of Galactic Soft X-ray Transient (SXT) XTE J1550-564 during 2000 outburst using RXTE instruments and compare the accretion scenario with the 1998 outburst. This variability study includes the study of Power Density Spectrum (PDS) and Fourier Frequency dependent lag spectra with the variation of photon energy. We observe QPO frequency increases from ~ 0.26 Hz to ~ 6.92 Hz in ~ 30 days and immediately starts to decrease gradually in the declining phase and also it disappears after ~ 13 days. We find a smooth variation in time-lag with QPO frequency and the lag becomes soft-lag after the QPO frequency > 3 Hz. The time-lag again becomes hard-lag and increases gradually. In the previous 1998 outburst, the source took ~ 12 days to reach QPO frequency from 81 mHz to ~ 13.1 Hz and in next 7 days it decreases to ~ 2.62 Hz. A similar time-lag variation is also observed during rising phase where time-lag transition frequency was also > 3 Hz. We explain this transitional frequency implies a specific size of the Comptonizing region and subsequently it gives rise to a characteristic length scale where the lag changes its sign. We expect, this transitional frequency can't be an universal one for all sources as the inclination angle and mass of the black hole could determine the length scale of the specific accretion geometry.

Presentation Type

Poster

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