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Spectral properties of XTE J1701-462 using AstroSat

Weakly magnetized low mass X-ray binaries (LMXB) with neutron star (NS) as a compact object are classified into Z sources and atoll sources based on their correlated spectral and temporal variability properties. The colour-colour diagrams (CDs)/hardness-intensity diagrams (HIDs) of atoll sources are characterized by isolated clumps called 'island states'which at times extend to form an elongated curve called the 'banana branch' that are traced out on timescales of weeks to months. On the other hand, the CD/HID of Z sources are characterized by the three main branches - horizontal branch (HB), normal branch (NB) and flaring branch (FB) - forming a Z shape that is traced out on timescales of hours to weeks. The physical mechanisms which drive these differences remain uncertain. The missing link of the Z - atoll puzzle was found in the NS-LMXB source: XTE J1701–462, which over the course of its 2006–2007 outburst, evolved through all subclasses of NS-LMXBs from a Cyg-like Z source at the highest luminosities to a Sco-like one, followed by a phase in the 'banana branch'. We have studied the spectral properties of XTE J1701-462 in the 0.3 - 25 keV energy range using data from the Soft X-ray Telescope (SXT) and Large Area X-ray Proportional Counter (LAXPC) instruments on-board the AstroSat mission. Using spectral properties, we have inferred physical parameters such as radius of inner disk, mass accretion rate etc. These results will be presented in the conference.

Presentation Type

Poster

Primary author: THOMAS, Neal (CHRIST (Deemed to be University))

Co-authors: S. G., Bubbly (CHRIST (Deemed to be University)); JIRAWALA, Khushi (CHRIST(Deemed to be University)); GUDENNAVAR, Shivappa (CHRIST (Deemed to be University), Bengaluru); Ms NAKRA, Vaishnavi (CHRIST (Deemed to be University))

Presenter: THOMAS, Neal (CHRIST (Deemed to be University))

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