Contribution ID: **15** Type: **Flash-talk**

Quasi-Periodic Oscillations due to the Radiative Feedback Interaction between the Accretion Disc and Corona in Accreting binaries

Accreting X-ray binary systems with compact objects exhibit Quasi-Periodic Oscillations (QPOs) characterized by peaked features in their power density spectra. It is known that stochastic variations in the truncated accretion disc may propagate to the hot corona with a time delay, and the resulting hard X-rays from the corona impact the disc, leading to reflection features in the energy spectra. In this study, we demonstrate that the interplay between these two effects creates a straightforward radiative feedback system between the corona and the disc, naturally giving rise to the observed QPOs. The primary frequency of these QPOs corresponds inversely to the time delay. We present the analytical form of the anticipated power spectra, which can be statistically compared with the observed ones. Consequently, for the first time, a physical model is employed to describe and fit the power spectra observed by AstroSat in the cases of the black hole systems MAXI J1535-571 and GRS 1915+105. This model successfully accounts for the QPO, its harmonics, and the broad band components. We discuss the implications of these results for the properties of the corona and the accretion disk in X-ray binaries.

Affiliation

Inter-University Centre for Astronomy and Astrophysics (IUCAA)

E-mail

akashgarg.jmi@gmail.com

Authors: GARG, Akash (Inter-University Centre for Astronomy and Astrophysics (IUCAA)); Prof. MISRA, Ranjeev (Inter-University Centre for Astronomy and Astrophysics (IUCAA)); Dr SEN, Somasri (Jamia Millia Islamia)

Presenter: GARG, Akash (Inter-University Centre for Astronomy and Astrophysics (IUCAA))

Session Classification: Flash-talk

Track Classification: Flash-talk