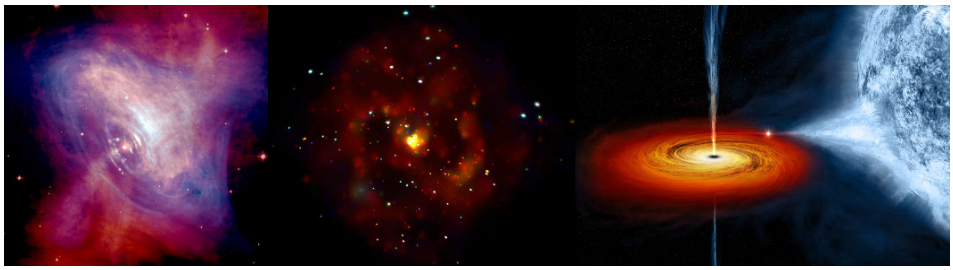

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Studying the accretion physics of two unique magnetic cataclysmic variables using broadband X-ray data

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Asynchronous polars (APs) are an exceptional type of magnetic cataclysmic variables where there is a lack (~1-2%) of perfect synchronicity, unlike polars, between the spin period of the primary white dwarf star and the orbital period of the binary system. Also, there are a few unusual intermediate polars (IPs) where the difference between spin and orbital period is much less (~10-20%) compared to the traditional IPs (>~ 90%). We present the broadband X-ray study of two such unique systems –CD Ind and Paloma, which neither conform to Polars nor IPs. Using simultaneous data from XMM-Newton and NuSTAR observatories, covering 0.3-40 keV energy band, our works highlight the essential X-ray properties of these systems, like the multi-temperature continuum of the Post shock region (PSR), the complexity of intrinsic absorption, the strength of Fe K-alpha lines and presence of Compton reflection. We have found for CD Ind; the PSR can be described by a three-component plasma emission model, with a strong ionised Oxygen K-alpha line in the soft X-rays, indicating an extra optically thin plasma emission region near the base of PSR. We also noticed strong spectral variability for nearly one-third of the spin cycle. In the case of Paloma, we witness the presence of a powerful and complicated intrinsic absorber, varying with the rotation of the system. One distinguishing feature of Paloma appears to be a strong orbital peak and weak spin peak in the power spectrum. Regarding the shock height, we found, for both the sources a weak neutral Fe K-alpha line and weak Compton reflection in the hard X-rays implying a tall shock scenario.

Presentation Type

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