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X-ray Spectroscopy and Polarimetry of Black Hole X-ray Binaries (BHXBs)

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X-ray Polarimetry will open a new window in X-ray Astronomy that can revolutionize the current understanding of the accretion and ejection mechanisms of black holes X-ray binaries (BHXBs).. With the upcoming launch of the Imaging X-ray Polarimetry Explorer (IXPE) in 2021, X-ray astronomy will be benefited with the additional Polarimetry signal along the currently existing timing and spectroscopic analysis. Since BHXBs are highly variable in time, the polarimetry signals might also vary depending upon various intrinsic properties. So, it is necessary to have a thorough spectral and timing analysis of different states of the source. In my PhD work we are performing a spectroscopic analysis of different states of the well known Low Mass X-ray Binary GRS 1915+105 and we will check how the polarimetric signal varies in different states. We have found strong evidence of an accretion disk wind using the Chandra HETGS spectra, and we are modeling it using both Xstar and the MHD as in the case of accretion disk winds in GRO J1655-40 (Fukumura et al 2017). We further simulated the modulation factor and angle as to be seen by IXPE using the ixpeobsim simulator for the different states of GRS 1915+105. We plan to extend the same analysis for other X-ray binaries like Cygnus X-1, Cygnus X-3 etc.

Topic

Future missions

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