

Orbital Phase Spectroscopy of four High Mass X-ray Binary Pulsars to Study the Stellar Wind of the Companion Star

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High Mass X-ray Binary Pulsars (HMXBP), in which the companion star is a source of supersonic stellar wind, provide a good laboratory to probe the velocity and density profile of such winds. We have measured the X-ray spectral evolution over the binary orbit for four such HMXBP; viz. GX 301-2, 4U 1538-52, OAO 1657-415 and Vela X-1, observed with the Rossi X-ray Timing Explorer and the BeppoSAX satellites. The variation of the absorption column density along with other spectral parameters with orbital phase was measured. A spherically symmetric wind profile was used as a model to compare the observed column density variations. In 4U 1538-52, we found the model corroborating the observations, whereas in GX 301-2, the stellar wind seems to be very clumpy and a smooth symmetric stellar wind model seems to be inadequate in explaining the data. Moreover, in GX 301-2, neither the presence of a disk nor a gas stream from the companion was validated.