
Photoionisation instability of winds in X-ray binaries

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Abstract

Accretion disc winds in X-ray binaries have been recently recognised to be a major ingredient of accretion. Recent results indicate that they can carry away more matter than the one accreted onto the compact object, that their presence appears connected with the state of the accretion disc and with the absence of the jet. Here we present the case of AX J1745.6-2901, a neutron star Low Mass X-ray Binary showcasing intense ionised Fe K absorption only during the soft state. Thanks to the availability of a large number of simultaneous XMM-Newton and NuSTAR spectra, we accurately determine the X-ray spectral energy distribution and its variations between the states. We observe that the ionised absorber lies always on a stable branch of the photo-ionisation stability curve during the soft state, while it becomes unstable during the hard state. The same process might explain the disappearance of the high ionisation absorber/wind during the hard state in other systems.

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