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Evaluating the jet/accretion coupling of Aql X-1: probing the contribution of accretion flow spectral components

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The coupling between radio and X-ray luminosity is an important diagnostic tool to study the connection between the accretion inflow and jet outflow for low-mass X-ray binaries (LMXBs). Moreover, the comparison of NS- and BH-LMXBs provides useful information about the role of compact objects in launching jets. Interestingly, studies have shown discrepancies between the radio-X-ray coupling of NS- and BH-LMXB sources. The radio/X-ray correlation for individual NS-LMXB sources is scattered, whereas for individual BH-LMXBs a more consistent correlation is generally found. Furthermore, we observe jet quenching for both types of LMXBs, but it is unclear what exactly causes this, and if jets in NS-LMXBs quench as strongly as those in BH-LMXBs. While additional soft X-ray spectral components can be present for NS-LMXBs due to the presence of the neutron star's surface, disentangling the individual X-ray spectral components has thus far not been considered when studying the radio/X-ray coupling. In this talk, I will present our work on analysing eleven epochs of Swift/XRT observations matched with quasi-simultaneous archival radio observations of the 2009 November outburst of Aql X-1. In this study we decompose thermal and Comptonised spectral components in Swift/XRT spectra, discuss whether the presence of additional thermal emission affects the coupling of the radio/X-ray luminosity, and give recommendations for future research.

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