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Phase Lags on High Frequency Quasi-Periodic Oscillations in the transient source XTE 1701-462

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Variability in the emission of neutron stars and black holes X-ray binaries is a very puzzling field of study: the nature of the mechanism that produces the oscillations is still a subject of debate and unravelling this mystery could bring us closer to understand the physics in extreme environments like the ones around compact objects. Using Fourier techniques in X-ray timing analysis, we study archival RXTE observations of the unique transient neutron star X-ray binary: XTE 1701-462. These observations show the source transitioning from Z state into atoll state, while kHz QPOs (quasi-periodic oscillations at kHz Fourier frequencies) are present in its light curve. We analyse the power and lag spectra of each observation to measure the time delay between the hard and soft X-ray emission of the source around the QPOs frequencies. Studying this particular source, using X-ray timing techniques, could give us an important understanding into the differences between atoll and Z sources, especially regarding the different timing behaviour (strength and intensity of the variability) that we see in them. Preliminary results of this analysis will be shown in the poster.

Topic

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