

## Black hole transient 4U 1630-47: nature of the mHz QPO and its phase-resolved soft X-ray spectra

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We report the discovery of a 4.1-sigma significance 9.5 mHz QPO in Swift/XRT observation of the black hole candidate 4U 1630-472. mHz QPO with period longer than 100 seconds has never been discovered in this source. Phase-resolved spectroscopy revealed an accretion disk inner radius without significant change with phase. Phase dependent iron absorption feature has been discovered for the first time in this source. Under typical systematical parameters for a Galactic black hole binary system, the inner radius lies in the very vicinity of the black hole. We assumed that the accretion disk existed down to the ISCO. This allows us to measure the spin of 4U 1630-472 for possible binary system systematical parameters.

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