

Oscillations of black hole accretion disks and neutron star atmospheres

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Quasi-periodic oscillations (QPOs) in the kHz range have been reported in the X-ray flux of several accreting black hole and neutron star systems. While several models have been suggested, such variability has been difficult to reproduce in numerical simulations. I will report on Radiative General Relativistic Hydrodynamic Simulations of accretion disks in which several high-frequency oscillations of the accretion disk have been found, and their nature identified. Similar periodicities have also been reported during thermonuclear X-ray bursts in neutron stars. A calculation of damped oscillations of neutron star atmospheres in the super-Eddington regime will be presented, which allows a direct and simultaneous determination of the mass and radius of the neutron star from the value of the maximum oscillation frequency alone.

Refs.: Mishra et al. 2017, 2018; Bollimpali et al. 2018.

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