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Quasi-periodic oscillations of perturbed tori

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Our research focuses on axisymmetric hydrodynamical simulations. The models implemented are *thinner* tori and *thicker* torus in equilibrium around a non-rotating black hole. The tori were constructed with a constant distribution of angular momentum obtained from Kluzniak-Lee (a pseudo-Newtonian) potential. Epicyclic motion were triggered by adding sub-sonic velocity fields; radial, vertical and diagonal. As the perturbed tori evolved in time, we measured L_2 norm of density and obtained the power spectrum which manifested modes as predicted by theory. Results from our simulations are relevant in the context of high-frequency quasi-periodic oscillations (HF QPOs) observed in stellar-mass black hole binaries.

Collaboration

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