

Gravitational Geometry and Dynamics Group Seminar

Tue., September 10th, 2024, at 11h00.

Room: Sala Sousa Pinto and Zoom ID: 955 4130 8539

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Phase space mixing of a Vlasov gas in the exterior of a Kerr black hole

We analyze the dynamics of a collisionless kinetic gas propagating in the exterior of a rotating Kerr black hole. We focus on the phase space region corresponding to orbits that are bounded in space. It will be shown that, although collisions between the gas particles are completely neglected in our model, the gas is subject to a relaxation phenomenon and converges in time to a stationary, axisymmetric configuration surrounding the black hole. This effect, like similar effects encountered in plasma physics and stellar dynamics, is due to the mixing property of the Hamiltonian phase flow, which implies that the one-particle distribution function converges weakly to a distribution function depending only on the constants of motion of the system.