Rotating clumps of scalar field Dark Matter

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Low-energy, self-gravitating solutions of a scalar field coupled to gravity, described by the Schrodinger-Poisson system, are good candidates for realistic astrophysical structures, being particularly suited to describe dark matter halos. In this work we study the scenario in which one of these structures is gravitationally perturbed by a point-like mass. We analyse the effects that the body has on the distribution of the scalar field and how it backreacts on the body's motion. We show that an initially static, spherical structure can develop rotating non-spherical clumps, the amplitude and the velocity of which are directly related to the mass of the orbiting particle. We also study the dissipation mechanisms involved in the transit of the point-like particle across the scalar field structure and we observe that the force responsible for the dissipation scales as the square of the mass of the particle.