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Title: Black hole eating boson star

Abstract: The light complex scalar field is a fundamental field in theoretical physics. It is one of the candidate of the dark matter and dark energy, and plays an important role in cosmology. One of the typical configurations of light complex scalar fields in the Universe is the boson star, which is the compact object supported by its own gravity and its pressure. The boson star in the Universe interacts with other astrophysical objects through gravity. In particular, when a black hole is inside a boson star, the black hole absorbs the energy of the boson star, and the boson star energy decreases. In order to evaluate the effect of black holes on the boson star, we solve the time evolution of the spherically symmetric boson star black hole system, and discuss the absorption process of the boson star's energy into black holes.