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Title: Observational signatures of bosonic stars at the galactic centre

Abstract: The GRAVITY collaboration has recently a detected continuous circular relativistic motion during infrared flares of Sgr A*, which has been interpreted as orbital motion near the event horizon of a black-hole. In this work, we use the ray-tracing code GYOTO to analyze the possibility of these observations being consistent with a central bosonic star instead of a black-hole. Our model consists of an isotropically emitting hot-spot orbiting a central boson or Proca star. Images of the orbit at different times and the integrated flux were obtained for both models and compared with the case of a Schwarzschild black-hole. Although the overall qualitative picture is comparable, the bosonic star models present an extra image when the emitting hot-spot passes behind the central object caused by photons travelling through the interior of the star. Furthermore, there are also measurable differences in the angles of deflection, orbital periods, and centroid of the flux, which can potentially be detected.