
Detecting non-Kerr signature in Sgr A* flares with current and future instruments

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Abstract

The heart of our galaxy harbors a supermassive compact object named Sagittarius A* (Sgr A*), with a mass of 4.3 million solar masses. Owing to its close proximity, certain general relativity tests have been executed using the orbits of S-Stars. However, these stars are situated too remotely to conduct tests of general relativity within the strongest regime, specifically at a few gravitational radii (r_g). Fortunately, Sgr A* regularly produces radiation bursts known as flares, occurring around $\sim 10 r_g$, which situates them within a strong gravitational regime. Despite significant astrophysical uncertainties, these flares provide a rare chance to investigate space-time characterized by intense curvature, particularly by employing polarization measurements. This is because polarization is influenced by the curvature of space-time and therefore can be utilized to unveil the properties of the compact object. In this presentation, I will discuss my research on the observability of non-Kerr, or exotic compact object signatures, in the flares of Sgr A* with GRAVITY, and explore the potential of future instruments.

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