

BLACK HOLE SHADOW AS USEFUL TOOL FOR TESTING THE GRAVITY THEORIES

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Abstract

The observation of black hole shadows by the Event Horizon Telescope (EHT) has opened a new window for testing gravity theories in the strong-field regime. The shadow, a dark region caused by photon capture near the event horizon, encodes information about spacetime geometry, making it a powerful probe for alternatives to general relativity (GR). By comparing theoretical predictions of shadow morphology – influenced by parameters such as spin, charge, and modified gravity corrections – with high-resolution imaging data, stringent constraints can be placed on deviations from GR, including scalar-tensor, $f(R)$, and extra-dimensional theories. This review highlights recent advances in shadow of the black holes, the role of gravitational physics, and the coordinate independent way to describe the image.