APR21-2021-020004

Abstract for an Invited Paper
for the APR21 Meeting of
the American Physical Society

Gravitational Test Beyond the First Post-Newtonian Order with the EHT[1]

LIA MEDEIROS, Institute for Advanced Study

In April of 2019 the Event Horizon Telescope (EHT) published the first image of a supermassive black hole resolved to event horizon scales. This image led to the first measurement of the size of a black-hole shadow, the shadow that the black hole casts on the surrounding emission. We use analytic calculations and numerical simulations to place constraints on regular, parametric, non-Kerr metrics and to identify the common characteristic among these different parametrizations that controls the predicted shadow size. We also connect our work to previous tests and show that spacetimes that deviate from the Kerr metric but satisfy weak-field tests can lead to large deviations in the predicted black-hole shadows that are inconsistent with even the current EHT measurements.

[1]NSF Astronomy and Astrophysics Postdoctoral Fellow