Contribution ID: **28** Type: **not specified**

S. Kejriwal: More Realistic Inference of EMRI Environments

Friday, June 9, 2023 11:30 AM (30 minutes)

Extreme-mass-ratio inspirals (EMRIs) will allow precise measurements of trajectories of a compact object in the strong-gravity regime around a supermassive black hole, making the detection of beyond-GR effects possible. However, environmental effects such as an accretion disk, can give rise to dephasing effects in the compact object's trajectories, with the potential to raise false alarm in the search for deviations from GR. Thus, the modeling of all dominant environmental effects becomes essential to ensure unbiased measurements of EMRI parameters via the upcoming LISA gravitational wave observatory. Current state-of-the-art estimates of dephasing caused by environmental effects in EMRIs (i) assume a simplistic EMRI with Schwarzschild spacetime with the secondary on a quasi-circular and equatorial orbit, (ii) only give leading-order estimates with respect to the gravitational wave self-force, and (iii) do not analyze two or more environmental effects together. In this presentation, we propose studies of environmental effects in more realistic EMRIs addressing the three limitations mentioned above with a significant focus on analyses of two or more environmental effects together for the first time ever.