

Detecting scalar field with extreme mass ratio inspirals

Thursday, April 1, 2021 2:45 PM (15 minutes)

I will present extreme mass ratio inspirals (EMRIs), during which a small body spirals into a supermassive black hole, in gravity theories with additional scalar fields. No-hair theorems and properties of known theories that manage to circumvent them introduce a drastic simplification to the problem: the effects of the scalar on supermassive black holes, if any, are mostly negligible for EMRIs in vast classes of theories. I will show how to exploit this simplification to model the inspiral perturbatively and demonstrate that the scalar charge of the small body leaves a significant imprint on gravitational wave emission. This result is particularly appealing, as this imprint is observable with LISA, rendering EMRIs promising probes of scalar fields.

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