Contribution ID: **71** Type: **not specified**

Self Force Resonance

Tuesday 4 July 2023 16:00 (20 minutes)

Self-force resonance is a resonance phenomenon that occurs when the ratio of orbital frequencies becomes a simple rational number. Its contribution appears at 0.5 post-adiabatic order, making it the next-to-leading effect after the adiabatic radiation reaction. Moreover,it is estimated that almost all EMRI systems experience this type of resonance, and so its theoretical prediction is essential for future observations. The resonance contribution can be divided into a dissipative and a conservative part, as in the usual self-force calculations. The effect of the conservative part is expected to cause a jump across the resonance only in the Carter constant. The calculation of the conservative part is more involved since it requires regularization and is currently under development. In this study, a numerical implementation of the conservative part of the resonance is developed in a scalar field toy model using an alternative regularization method proposed in Isoyama et al. 2013, based on the point splitting. The advantage of this method is in its simplicity in deriving the counter terms, although its usefulness has never been demonstrated yet. Several difficulties that were not recognized prior to the actual implementation are found and their solutions are proposed. In Our goal is to examine the effectiveness of the Hamiltonian formalism with the point-splitting method, by extending the scalar toy model to the gravitational case.

Presenter: KAKEHI, Takafumi (Yukawa Institute for Theoretical Physics, Kyoto University)

Session Classification: Tuesday Afternoon