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Radiation Reaction in de Sitter spacetime

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I am interested in understanding radiation reaction(RR) and the post-Newtonian(PN) expansion in the presence of a cosmological constant. To this end, de Sitter spacetime provides a simple maximally symmetric background, where the in-in action that describes the RR can be computed. This in-in action has a natural interpretation through a 'doubled' static patch geometry associated with a particle. In particular, for a particle coupled to a scalar field in arbitrary dimensional de Sitter spacetime, we derive curvature corrections to the flat space RR action and the necessary counterterms for regularisation to all orders in the cosmological constant. The 'classical' part of the scalar RR force matches existing results in the literature (flat space as well as curvature corrections). At long times, our action describes the effect of Hawking radiation from the cosmological horizon.

Presenter: SHETYE, Omkar (International Centre for Theoretical Sciences (ICTS-TIFR), Bengaluru)

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