

Three-Body Effective Potential in General Relativity at 2PM and Resulting PN Contributions

Monday, 22 November 2021 16:00 (15 minutes)

In this talk, I will talk about the Post-Newtonian expansion of the gravitational three-body effective potential at the 2nd Post-Minkowskian order. At order 2PM a formal result is given in terms of a differential operator acting on the maximal generalized cut of the one-loop triangle integral. We perform the PN expansion unambiguously at the level of the integrand. Finding agreement with the 2PN three-body potential after integration, we explicitly present new $G^2 v^4$ -contributions at order 3PN and outline the generalization to $G^2 v^{2n}$. The integrals that represent the essential input for these results respect a non-local Yangian symmetry and are obtained by applying the recent bootstrapping method directly to their ϵ -expansion around three dimensions. The coordinate space Yangian generator that we employ to obtain these integrals can be understood as a special conformal symmetry in a dual momentum space. If time permits, I will also talk about our work in progress on finding such integrals of generic half-integer propagator powers.

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Session Classification: Short talks