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Classical Black-Hole Scattering and Gravitational Waves from the Eikonal Exponentiation

Thursday 29 September 2022 14:40 (20 minutes)

The eikonal exponentiation provides a natural strategy to calculate classical gravitational observables directly from the loop-expansion of gravity amplitudes. In this talk I will discuss how the eikonal can be applied to obtain the deflection angle for the collision of two non-spinning black holes. The inclusion of radiation-reaction effects results in an expression with a smooth behavior at high energies, where it agrees with the universal massless result up to $O(G3)$. I will also illustrate how the eikonal can be promoted to an operator combining elastic and inelastic amplitudes in order to calculate all observables associated to the asymptotic states of classical scattering, including the changes in linear and angular momentum for each colliding body.

Summary

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