Poster Session #C
Gravity theories

C08

General Relativity from Scattering Amplitudes

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We outline the program to apply modern quantum field theory methods to calculate observables in classical general relativity through a truncation to classical terms of the multi-graviton two-body on-shell scattering amplitudes between massive fields. Since only long-distance interactions corresponding to non-analytic pieces need to be included, unitarity cuts provide substantial simplifications for both post-Newtonian and post-Minkowskian expansions. We illustrate this quantum field theoretic approach to classical general relativity by computing the interaction potentials to second order in the post-Newtonian expansion, and deriving the static Schwarzschild-Tangherlini metric by extracting the classical contributions from the multi-loop vertex functions of a graviton emitted from a massive scalar field.