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Collider Physics tools for classical gravitational wave observables

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In this talk, I will review some of the recent developments in applying Quantum Field Theory ideas and scattering amplitudes technology to the study of classical gravitational observables that are relevant to e.g. the LIGO/VIRGO detectors. I will mostly focus on a particular framework, originally devised by Kosower, Maybee, and O'Connell, to extract classical physics from quantum observables. This particular avenue opens the possibility to transfer numerous advances from collider physics calculations, such as integration-by-parts relations, reverse unitarity, and (canonical) differential equations to evaluate the relevant Feynman integrals that appear in the classical gravitational observables of interest. We find surprising similarities between maximally supersymmetric gravity as well as pure Einstein gravity.

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