

The two-loop five-gluon all-plus helicity amplitude

Monday, September 9, 2019 6:00 PM (25 minutes)

As the experimental precision at the LHC keeps improving, next-to-next-to leading order (NNLO) corrections for scattering processes have become crucial for providing theoretical predictions of comparable accuracy. At present, only observables involving up to four particles are available at this order. The main bottleneck towards higher multiplicity observables is the analytic calculation of the required two-loop scattering amplitudes. I present the first fully analytic result for a full-color two-loop five-particle amplitude: the five-gluon amplitude in the all-plus helicity configuration. In order to achieve it, we analytically calculated all master integrals that describe the NNLO virtual corrections for the three-jet production. We express the amplitude in a remarkably compact form containing only logarithms, dilogarithms, and rational functions.

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Session Classification: Monday Afternoon