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Analytical calculations for $Wt\bar{t}$ production at NLO

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In anticipation of the full Run 3 data set and the High-Luminosity phase of the LHC, the computation of scattering amplitudes at high loop order and multiplicity is of high importance. One of the heaviest Standard Model signatures currently probed at the LHC is the production of a top-antitop quark pair in association with a W boson. It plays a crucial role in the search for physics beyond the Standard Model and is an important background for Higgs boson production in association with a top-antitop quark pair. We compute this amplitude at next-to-leading order as a form factor decomposition in the 't Hooft Veltman scheme and discuss the choice of tensor basis. We identify all topologies appearing in the one-loop Feynman integrals, provide a canonical differential equation for the master integrals, and discuss issues appearing due to the large number of scales involved.

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Session Classification: Short talks