

## Analytic Computation of $t\bar{t}$ production at Hadron Colliders

We present new compact analytic one-loop helicity amplitudes for  $t\bar{t}$  production at Hadron colliders. The results were obtained employing a combination of on-shell methods and advanced Feynman diagram techniques. In particular the tadpole, the rational and mass renormalization contributions were extracted from the latter approach. For the cut constructible pieces we used the method of generalized unitarity. Further improvements were obtained by applying the constraints coming from the universal singular behaviour. The analytic expressions can be implemented in existing codes to provide faster and numerically more stable results for phenomenological studies.

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