

Higgs Pair Production at High-Energy

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Currently, predictions for Higgs pair production at NLO in QCD including the exact top-quark mass dependence are known only numerically. The numerical calculations have proven to be adequate for making predictions up to moderate values of the Higgs pair invariant mass and Higgs boson transverse momentum. Unfortunately, the numerical calculations can be very compute-intensive to run and can also become increasingly challenging at large invariant mass or transverse momentum. More recently, analytic results valid in the high-energy limit have been computed which can provide important complementary information to the numerical calculations. In this work, after applying a naive Padé approximation which extends the range of validity of the high-energy expansion, we combine the exact numerical results with the expanded results in order to produce a stable prediction valid in the low, medium and high-energy regimes. Improved predictions for hadron colliders with centre-of-mass energies of 14 TeV and 100 TeV are presented.

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