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Top-quark mass measurements using jet rates at LHC

This work presents a new method to measure the top-quark mass in hadronic collisions. The method uses the sensitivity of the ttbar+1Jet production on the top-quark mass. In detail we study the R distribution defined as the ttbar+1Jet normalized differential cross section in the invariant mass of the total system and calculated at NLO accuracy. We prove that the \R distribution has a high sensitivity to the top-quark mass. Furthermore we also investigate and quantify the impact of the dominant theoretical and experimental uncertainties. The results obtained show, that the method will be competitive in precision with established approaches and allows a complementary measurement of the top-quark mass at hadron colliders. We emphasize that in the proposed method the mass parameter is uniquely defined through one-loop renormalization.

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