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Determination of the top-quark mass from single top-quark production in hadronic collisions

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We determine the mass of the top quark from cross section data for the hadro-production of single top quarks in the t- and s-channel reactions. We apply QCD perturbative corrections up to next-to-next-to-leading order terms from soft-gluon resummation to extract the top-quark mass in well-defined renormalization schemes. The cross section for the production of single top quarks is dominated by the light quark-flavor distributions in the proton, which allows for a mass determination largely independent of the gluon distribution.

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