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NNLO top quark pair production

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I give an overview on the current theoretical status of the top quark pair production total cross section focusing on the recently derived NNLO result for the gluon fusion channel, which completes the fixed order NNLO calculations. Using our result to provide the NNLO+NNLL prediction for the total cross section, I discuss its phenomenological impact and compare it with the most precise LHC and Tevatron data. In particular I explain the influence of the available NNLO PDF sets on the theoretical prediction as well as how top quark pair production can be used to constrain the gluon PDF at large x , which can lead to improved predictions for Beyond the Standard Model processes at the LHC.

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