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Higgs pair production at the LHC with NLO and parton-shower effects

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I will present predictions for the SM-Higgs-pair production channels at the LHC: gluon-gluon fusion, VBF, and top-pair, W, Z and single-top associated production. Results are at the NLO accuracy in QCD, and matched to parton showers by means of the MC@NLO method; hence, they are fully differential. With the exception of the gluon-gluon fusion process, for which a special treatment was needed in order to improve upon the infinite-top-mass limit, our predictions have been obtained in a fully automatic way within the publicly available MadGraph5_aMC@NLO framework. I will show that for all channels in general, and for gluon-gluon fusion and top-pair associated production in particular, NLO corrections reduce the theoretical uncertainties, and are needed in order to provide reliable predictions for total rates as well as for distributions. Based on arXiv:1401.7340.

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