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Parton shower and finite-top mass effects in HH production

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Studying the pair production of Higgs bosons at the LHC is important as it is sensitive to the Higgs trilinear coupling. It therefore allows for a direct test of the Higgs potential and the mechanism of electroweak symmetry breaking.

Since the heavy top limit provides only a poor description of Higgs boson pair production, a precise theoretical description of this process requires the evaluation of massive top loops at leading order, and massive two-loop diagrams at NLO. In this talk we will present a calculation of the NLO cross section for Higgs boson pairs, retaining the full dependence on the top-quark mass, and supplementing it with a parton shower. We further investigate the finite top-quark mass effects and the impact of the parton shower on several differential observables.

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