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Precision tools for the simulation of double-Higgs production via vector-boson fusion

We present two precision tools for the simulation of Higgs-pair production via vector-boson fusion in the kappa framework for the parameterization of non-standard Higgs couplings. A new implementation of the process is developed in the framework of the POWHEG-BOX program that can be used to provide predictions at the next-to-leading order (NLO) of QCD matched to parton showers (PS). In addition, the existing proVBFHH program for the computation of next-to-next-to-leading order (NNLO) QCD and next-to-next-to-next-to-leading order QCD corrections is extended to account for values of the Higgs couplings different from the expectation of the Standard Model.

We systematically compare and analyse predictions obtained with the two programs and find that the NLO+PS predictions provide a good approximation of the NNLO results for observables of the tagging jets and Higgs bosons. The results turn out to be very sensitive to the values of the modified Higgs couplings.

Secondary track

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