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Parton-shower effects in vector-boson-fusion processes

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Abstract content

Production of electroweak bosons via vector-boson fusion (VBF) is one of the main process classes to study during the run-2 phase of the LHC. Its double-DIS-like structure gives rise to the characteristic signature of two tagging jets in the forward regions of the detectors, and distinguishes it from QCD-induced processes, which exhibit much more central jet activity. VBF processes allow to study the triple and quartic gauge couplings and test them for new-physics effects.

In this talk, we investigate the effects of combining NLO QCD results with parton-shower effects using the latest versions of VBFNLO 3 and Herwig 7. A consistent treatment of renormalization and factorization scale variations in the hard process and the parton shower allows to assign more reliable theory uncertainty predictions to key distributions like the central rapidity gap. Additionally, we compare the effect of parton-shower and new-physics effects on distributions and study how to distinguish the two.

Summary

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