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Higgs boson CP-properties in Higgs plus three jet production via gluon fusion at the LHC

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In high energy hadronic collisions, a general CP-violating Higgs boson Φ with accompanying jets can be efficiently produced via gluon fusion, which is mediated by heavy quark loops.

We study the dominant sub-channel $gg \rightarrow \Phi ggg$ of the gluon fusion production process with triple real emission corrections at order α_s^5 .

We go beyond the heavy top limit approximation and include the full mass dependence of the top- and bottom-quark contributions.

Furthermore, we show within a toy-model scenario that bottom-quark loop contributions in combination with large values of $\tan\beta$ can modify visibly the differential distributions sensitive to Φ -measurements of the Higgs boson particle.

Summary

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