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Classifying the CP properties of the ggH coupling in H+2j production

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The Higgs-gluon interaction is crucial for LHC phenomenology. To improve the constraints on the CP structure of this coupling, in this talk I will investigate Higgs production with two jets using machine learning. In particular, the CP sensitivity of the so far neglected phase space region that differs from the typical vector boson fusion-like kinematics is exploited. The presented results suggest that significant improvements in current experimental limits are possible. In the talk I also discuss the most relevant observables and how CP violation in the Higgs-gluon interaction can be disentangled from CP violation in the interaction between the Higgs boson and massive vector bosons. Assuming the absence of CP-violating Higgs interactions with coloured beyond-the-Standard-Model states, the projected limits on a CP-violating top-Yukawa coupling are stronger than more direct probes like top-associated Higgs production and limits from a global fit.

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