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Probing anomalous Higgs self couplings via single Higgs production at the LHC

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The Higgs self-coupling is still a missing piece in the Standard Model puzzle. Although its theoretical value can be extracted from its relation to the mass of the Higgs and the Fermi constant, its measurement via double Higgs production is particularly challenging. We explore the possibility of probing an anomalous trilinear coupling indirectly, through the production and decay of a single Higgs boson. Indeed, although these processes do not depend on this coupling at tree level, they are sensitive to the Higgs self-coupling at NLO. This gives us the opportunity to derive current and possible future constraints on the trilinear coupling from precise measurements of various observables of the different single-Higgs production channels.

Summary

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