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Modification of Higgs Pair Production by Stops at the LHC and Beyond

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The Higgs pair production in gluon fusion is a sensitive probe of beyond-Standard Model (BSM) phenomena. Motivated by the combined analysis of ATLAS and CMS Higgs production data, which allows moderate deviations of the Higgs couplings with respect to their Standard Model (SM) values, we show that the Higgs pair production may be significantly increased with respect to the SM predictions in a simplified model with light stops and staus allowed by the latest LHC search bounds. We also explore the implications of such modification of the cross-section in the context of discovering the deviation in the triple Higgs coupling from the SM value, which is strongly correlated with First order phase transitions of the scalar potential in many models e.g. NMSSM.

Summary

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