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Pair Production of Higgs Boson in G2HDM at the LHC

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Pair production of Higgs boson at the Large Hadron Collider (LHC) is known to be important for the determination of Higgs boson self-coupling and the probe of new physics beyond the Standard Model (SM), especially the existence of new fundamental scalar boson. In this paper we study in detail the Higgs pair production at the LHC in a well-motivated model, the Gauged Two Higgs Doublet Model (G2HDM) in which the two Higgs doublets are properly embedded into a gauged $SU(2)_H$ and a dark matter candidate emerges naturally due to the gauge symmetry. Besides the deviations of Higgs couplings from the SM predictions, the existence of new scalars could enhance the production cross section of Higgs boson pair at the LHC significantly. However, when we take into account the relic density of dark matter and the null result in its direct search, only moderate enhancement can be maintained. We also comment on the capability of distinguishing the signal of a new generic scalar from the SM at the LHC, assuming the Higgs pair production cross sections are the same.

Type

Parallel talk

Sessions (parallel only)

Beyond Stand Model

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