

Di-Higgs Production in Extended Higgs Sectors

We study di-Higgs production in various extended Higgs sector models such as the real and complex Two-Higgs-Doublet Model, the Two-Higgs-Doublet model augmented with a real singlet field and the next-to-Minimal Supersymmetric Standard Model. We study the di-Higgs production $pp \rightarrow h_i h_j$, in particular the $h_i = h_j = h_{125}$ GeV scalar particle case, and we also discuss the case where h_i and/or h_j are new scalar states predicted in the spectrum of the aforementioned models. When performing the parameter scan, we take into account all relevant theoretical and experimental constraints. We verified what is the impact of current di-Higgs searches to the parameter spaces of these models and present several benchmarks for SM-like or exotic di-Higgs production.

Primary author: AZEVEDO, Duarte (KIT)

Presenter: AZEVEDO, Duarte (KIT)

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