

Scalars 2015

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Scrutinizing the Alignment Limit in Two-Higgs-Doublet Models

Content :

In the alignment limit of a multi-doublet Higgs sector, one of the Higgs mass eigenstates aligns with the direction of the vacuum expectation value, and its couplings approach those of the Standard Model (SM). Considering the CP-conserving Two-Higgs-Doublet Models of Type I and Type II near the alignment limit, we focus on the case in which the heavier of the two CP-even state, H , is the 125 GeV SM-like state observed at the LHC. A decoupling regime thus cannot be attained in these scenarios since the lighter CP-even state, h , has a mass below 125 GeV by definition.

After a short review of the theoretical structure, the phenomenological consequences of this realization of the alignment regime are presented. Implications for the coming 13 TeV LHC run, including expectations regarding the observation of the extra scalar states, are discussed.

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