

The XXIX International Conference on Supersymmetry and Unification of Fundamental Interactions (SUSY 2022)



Contribution ID: 85

Type: **not specified**

2HDM Neutral Scalars under the LHC

Tuesday 28 June 2022 18:00 (20 minutes)

Two Higgs Doublet Models (2HDM) provide a simple framework for new physics models with an extended Higgs sector. The current LHC results, including both direct searches for additional non-Standard Model (SM) Higgs bosons, as well as precision measurements of the SM-like Higgs couplings, already provide strong constraints on the 2HDM parameter spaces. In this work, we examine those constraints for the neutral scalars in the Type-I and Type-II 2HDM. In addition to the direct search channels with SM final states: $H/A \rightarrow ff, VV, Vh, hh$, we study in particular the exotic decay channels of $H/A \rightarrow AZ/HZ$ once there is a mass hierarchy between the non-SM Higgses. We found that $H/A \rightarrow AZ/HZ$ channel has unique sensitivity to the alignment limit region which remains unconstrained by conventional searches and Higgs precision measurements. This mode also extends the reach at intermediate $\tan\beta$ for heavy m_A that are not covered by the other direct searches.

Primary authors: KLING, Felix (DESY); SU, Shufang (University of Arizona); SU, wei (University of Adelaide)

Presenter: SU, Shufang (University of Arizona)

Session Classification: Higgs theory and experiment