

# Scalars 2017



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## Cascade Decay of a Heavy Higgs

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### Content :

We study the discovery prospects of heavy neutral higgs bosons in Beyond the Standard Model scenarios where it cascade decays to a lighter scalar eigenstate which subsequently decays to the Standard Model Higgs. We consider either of 4 leptons and 2 b-jets or of 2 leptons + 4 b-jets final states. We find that these two signatures allows us to both optimally reduce the Standard Model backgrounds and reconstruct the mass of the parent Higgs boson. We first present a model independent analysis at the 14 TeV LHC for various benchmark points, and deduce the signal cross-sections necessary to report a  $5\sigma$  discovery. We then translate our result in the context of the Type-II Two-Higgs-Doublet Model and identify regions of parameter space in the  $\tan\beta$ - $\sin(\beta-\alpha)$  plane that permits discovery.

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