

Heavy Higgs as a Portal to the Supersymmetric Electroweak Sector

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We discuss prospects of searching for decays of heavy Higgs bosons into electroweak superpartners at the high luminosity LHC. In addition to the kinematic handles offered by the presence of a resonant particle in the production chain, heavy Higgs decays can be the dominant production mode of these superpartners, making it possible to extend coverage to otherwise inaccessible regions of the supersymmetry and heavy Higgs parameter space. We illustrate our ideas with detailed collider analyses of two specific topologies: heavy Higgs decay to a pair of neutralinos, which can probe heavy Higgs bosons up to 1 TeV in the intermediate $\tan \beta$ ($\sim 2 - 8$) region, where standard heavy Higgs searches have no reach. Similarly, we show that targeted searches for heavy Higgs decays into staus can probe stau masses up to several hundred GeV.

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