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HL-LHC and ILC sensitivities in the hunt for heavy Higgs bosons

We assess the sensitivity of the Large Hadron
Collider (LHC) in the high luminosity (HL) run alone and in combination
with a possible future International Linear Collider (ILC) to probe
heavy neutral Higgs bosons. We employ the Minimal Supersymmetric
Standard Model (MSSM) as a framework and assume the light \cp-even
MSSM Higgs boson to be the Higgs boson observed at 125~GeV.
We discuss the constraints on the MSSM parameter space arising from
the precision measurements of the rates of the detected signal at 125~GeV and fromdirect searches for new heavy Higgs bosons in the $\tau^+\tau^-$, $b\bar{b}$ and di-Higgs (hh) final states. For the future Higgs rate measurements at the HL-LHC and ILC two different
scenarios are investigated, namely the case where the future rate
measurements agree with the SM prediction and the case where the rates agree
with the predictions of possible realizations of
the MSSM Higgs sector in nature.

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