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Improved tau-weapons for Higgs hunting

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In this work, we use the results from Higgs searches in the $\gamma\gamma$ and $\tau\tau$ decay channels at LHC and indirect bounds as BR(B
toX_{γ}) to constrain the parameter space of a generic MSSM Higgs sector. In our analysis, we reduce to the minimum the model input and use only experimental information to restrict the scalar masses and mixings. In particular, we include the latest CMS results that look for additional Higgs states with masses up to 1 TeV. We show that the $\tau\tau$ channel is the best and most accurate weapon in the hunt for new Higgs states beyond the Standard Model. We obtain that present experimental results rule out additional neutral Higgs bosons in a generic MSSM below 300 GeV for any value of $\tan\beta$ and, for instance, values of $\tan\beta$ above 30 are only possible for Higgs masses above 600 GeV.

Summary

Presenter(s) : VIVES, Oscar (IFIC)