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## Search for $H \rightarrow \tau\tau$ in production processes in association with jets in CMS

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The analysis performed on the data collected by CMS during 2011, has excluded at 95% CL the possible existence of a SM-like Higgs boson in most of the mass region that has been explored, except for a window from 110 to 128 GeV/c<sup>2</sup>

In the search for a light Higgs boson, the  $\tau\tau$  final state plays a crucial role, thanks to its sizeable branching ratio and to the expected relatively low background contaminations.

In addition, couplings to tau leptons are favored in the Minimal Supersymmetric Standard Model (MSSM), making the  $\tau\tau$  channel sensitive to BSM Higgs bosons as well.

The production in association with jets, namely the Vector Boson Fusion (VBF) in the SM and b-quark associated production in the MSSM, presents a better signal-to-background ratio with respect to the gluon-fusion process, despite the low efficiency due to the selection of the signature jets. The inclusion of these production processes in the combined analysis considerably improves the sensitivity of the Higgs search of the  $\tau\tau$  final state.

The CMS results, based on the 2011 Data analysis and corresponding to 4.6 fb<sup>-1</sup> are presented and discussed along with the experimental issues related to the reconstruction of events in associated production processes.

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