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Type: **Talk**

Search for new resonances and di-Higgs production in channels involving taus

The CMS Collaboration reports on searches for new resonances decaying to final states with tau leptons, using data collected at the LHC. The talk will cover multiple final states with hadronic and leptonic tau decays, covering a wide mass range.

The $H \rightarrow \tau\tau$ decay mode has a relatively high BR and good S/B ratio when considering advanced techniques to reconstruct and identify tau leptons in all possible decay modes. This enables the search of rare process, as non-resonant di-Higgs production, where one of the Higgs boson decays to $\tau\tau$. Possible channels involve $H \rightarrow \gamma\gamma$, $H \rightarrow b\bar{b}$, associated with the $H \rightarrow \tau\tau$ decay. This presentation will also cover both the resonant and non-resonant HH decays, involving tau decays, using CMS data.

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