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Search for non-resonant Higgs bosons pairs production in the $b\bar{b}\tau\tau$ final state at CMS

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The most recent results on non-resonant Higgs bosons pairs production in the final state with two bottom quarks and two tau leptons will be presented. This final state has a sizeable branching fraction (7.3%) and the analysis benefit also from precise tau identification algorithms developed within the CMS collaboration. The analysis targets the gluon-gluon fusion and vector boson fusion production modes. 95% CL limits are set on SM production cross section, Higgs boson trilinear self-coupling and coupling of two Higgs bosons to two vector bosons. The sensitivity achieved by this search, performed with the full Run2 data set, is five times better than the one published using the LHC 2016 data set only. The improvement is determined by the larger statistics, the improved trigger strategy and by the use of Deep Neural Networks to perform objects selection and signal discrimination.

Primary author: LEON HOLGADO, Jaime (Centro de Investigaciones Energéticas Medioambientales y Tec. (ES))

Presenter: LEON HOLGADO, Jaime (Centro de Investigaciones Energéticas Medioambientales y Tec. (ES))

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