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Evidence for Higgs boson decays to a pair of tau leptons

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After the discovery of a Higgs boson in the $\gamma\gamma$, ZZ^* and WW^* final states in 2012, the search for leptonic decay modes plays a crucial role in the identification of this particle as the Standard Model Higgs boson. Tau leptons, as the heaviest charged leptons do contribute significantly to the decay width of a SM Higgs boson of mass $m_H = 125.5$ GeV.

Recent results on the search for Higgs boson decays to the $\tau\tau$ final state with the ATLAS detector are presented based on 21fb^{-1} proton-proton collision data collected at $\sqrt{s} = 8$ TeV.

To effectively suppress the high rate $Z \rightarrow \tau\tau$ background, the analysis exploits the distinct event topology of Higgs bosons produced via Vector-Boson-Fusion.

Based on multivariate classifiers the analysis offers a significant increase in sensitivity compared to results presented previously.

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