

Searches for lepton-flavour-violating decays of the Higgs boson into e tau and mu tau in $\sqrt{s}=13$ TeV pp collisions with the ATLAS detector

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This talk presents the results of a direct search for lepton-flavour-violating decays of the Higgs boson into e tau and mu tau final states with the ATLAS detector at the LHC with Run 2 data. Both leptonically and hadronically decaying tau leptons are included and two different background estimation techniques are employed: a MC-template method, based on data-corrected simulation samples, and a data-driven method, based on exploiting the symmetry between electrons and muons in the Standard Model backgrounds. Observed (Expected) upper limits are set on the branching ratios at 95% confidence level, $B(H \rightarrow e \tau) < 0.20\%$ (0.12%) and $B(H \rightarrow \mu \tau) < 0.18\%$ (0.09%), and a best-fit branching ratio difference, $B(H \rightarrow \mu \tau) - B(H \rightarrow e \tau)$, of 0.25 ± 0.10 is found in the channel where the tau-lepton decays to leptons, compatible with a value of zero within 2.5σ .

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