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Search for a Light Pseudoscalar Higgs Boson with Boosted Topologies at CMS

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A search is performed for a light pseudoscalar Higgs boson (a) motivated by the theoretical framework of two Higgs doublet plus singlet models (2HDM+S). This search uses the Full Run 2 LHC data collected at 13 TeV by the CMS experiment and analyzes the decay channel $H \rightarrow a \rightarrow \mu\mu\tau\tau$, with H being either the 125 GeV state or a more massive Higgs boson. Final state taus have a boosted and collimated topology due to the large mass difference between the H and a . A novel algorithm for special final states with hadronically decaying taus is designed to increase the identification efficiency. This analysis also includes machine learning techniques for the fully hadronically decaying tau channel.

Summary

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