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Search of Higgs boson in $H \rightarrow ZZ \rightarrow 2l2\tau$ final state

A search for the Standard Model Higgs in decay mode $H \rightarrow ZZ \rightarrow l + l - \tau + \tau -$, where $l = \mu, e$ is presented based on CMS data corresponding to an integrated luminosity of $\sim 25 \text{ fb}^{-1}$ (combined 2011, 2012 data). Hadronic and leptonic decays of τ are inspected, giving total eight final states which include all lepton flavours: e, μ and τ . No evidence is found for a significant deviation from standard model expectations anywhere in the ZZ mass range considered in this analysis. An interpretation of the results in terms of an upper limit on the production cross-section \times decay branching ratio for a Higgs boson decaying with standard model couplings is presented.

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