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Studies of rare Higgs decay H $\longrightarrow$ Zγ in CMS at $\sqrt{s}$ = 13 TeV

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The Higgs boson was discovered in 2012 and most of its properties agree with the standard model (SM). However, several rare Higgs boson decay channels haven't been observed, including the $H\to Z$ channel with the branching ratio of $(1.5\pm0.1)\times10^{-3}$. The rare Higgs decays provide probes for physics beyond the SM (BSM). Therefore, the search for $H\to Z$ decay is performed, where $Z\to l^+l^-$ with $l = e,$. It has a clean final state and loop-induced diagram sensitive to alteration in various BSM scenarios. The results, derived from the samples of proton-proton collisions at $\sqrt{s} = 13$ TeV, recorded by the CMS experiment at the LHC, will be presented in this poster. The expected and observed significance is 1.2 and 2.7 standard deviations, respectively, for a Higgs boson mass of 125.38 GeV. Similar results are also observed in the ATLAS experiment. Subsequently, two collaborations performed the combined analysis, showing the first evidence of this channel with 3.4 standard deviations.

Alternate track

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Yes

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