

# Search for Higgs boson in $H \rightarrow \gamma\gamma$ channel

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We present a search for a fermiophobic Higgs decaying to two photons. In the standard model the Higgs boson decays predominately to two bottom quarks for low Higgs masses, and the branching ratio for decays to two photons is on the order of 0.2%. However, in scenarios, where the Higgs boson only couples with other bosons,

$H$  to two photon decays are much more significant. Since the Higgs in this model does not couple to fermions, the production modes relevant to this search are associated Higgs production and vector boson fusion. The search is performed by looking for a peak in the diphoton mass spectrum. In the absence of an observed peak, we set upper limits on the cross section times branching ratio for fermiophobic Higgs production with subsequent decay to two photons.

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