

Title: Could the LHC two-photon signal correspond to the heavier scalar in two-Higgs-doublet models?

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Abstract: LHC has reported tantalizing hints for a Higgs boson of mass 125 GeV decaying into two photons. We focus on two-Higgs-doublet Models, and study the interesting possibility that the heavier scalar H has been seen, with the lightest scalar h having thus far escaped detection. Nonobservation of h at LEP severely constrains the parameter-space of two-Higgs-doublet models. We analyze cases where the decay $H \rightarrow hh$ is kinematically allowed, and cases where it is not, in the context of type I, type II, lepton-specific, and flipped models.

KeyWords Plus: Higgs Bosons; Search; LEP

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