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A 95 GeV Higgs Boson within a 2-Higgs Doublet Model

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This talk will focus on the implications of the excesses observed around 95 GeV in the di-photon and di-tau invariant mass distributions by the CMS collaboration at the LHC, together with the long-standing discrepancy observed around the same mass region at the Large Electron-Positron (LEP) collider in the b-bbar final state. The latest ATLAS search in the di-photon final state reveals an excess of events within the same mass range, albeit with a bit lower significance, thereby corroborating the observations made by CMS. We have found that all three excesses can be explained simultaneously within the general 2HDM Type-III where the lightest CP-even Higgs boson serves as the source of the excesses, while satisfying up-to-date theoretical and experimental constraints. Characteristic features of the model parameter space explaining the data will also be pointed out making way for further exploration of the model in the near future. In particular, the 2HDM Type-III predicts a significant enhancement in the ttbar-associated production of the SM-like 125 GeV Higgs boson. Such an effect can be tested soon at the High Luminosity LHC (HL-LHC).

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