

General CP-violating 2HDM in light of the excesses in di-photon searches at the LHC

Wednesday 6 November 2024 09:40 (20 minutes)

Recently, statistically significant excesses in inclusive and associated di-photon searches have been observed at the LHC, accumulating at around 95 GeV and 152 GeV, respectively. In this context, I will argue how the most general CP-violating 2HDM in the Yukawa alignment limit can account for these observations. In the Higgs basis, where the two scalar doublets are identified as H_1 and H_2 , the lagrangian term $Z_7 H_1^\dagger H_2 H_2^\dagger H_2 + \text{h.c.}$ enters the branching ratios to di-photon of the new physics (mostly) CP-even scalar (H) and the (mostly) CP-odd scalar (A) of the model. While $\Re[Z_7]$ contributes to $H \rightarrow \gamma\gamma$, $\Im[Z_7]$ affects $A \rightarrow \gamma\gamma$ and can be correlated with the observation of nonzero electric dipole moments.

Primary track

BSM Higgs physics

Is the speaker a PhD student or post-doc?

Yes - My participation will be fully supported by my research group

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Session Classification: BSM Higgs physics 3 - sal IX

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