

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

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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 the  $\Re[Z_7]$  contributes to  $H \rightarrow \gamma\gamma$ , the  $\Im[Z_7]$  affects  $A \rightarrow \gamma\gamma$  and can be correlated with the observation of nonzero electric dipole moments.

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