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Probing CP violation in Higgs $\rightarrow$ $\tau^+ \tau^- \gamma$

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Content :

Existing studies of Higgs-tau Yukawa coupling allows for the presence of a non-zero CP-odd contribution. This is usually probed and constrained at the LHC by studying the distribution of events with respect to the angle between the two tau decay planes in $H \rightarrow \tau^+ \tau^-$ decay. We study another interesting signature of CP violation, namely forward-backward asymmetry in the decay $H \rightarrow \tau^+ \tau^- \gamma$. This CP-asymmetry interestingly requires interference of tree and one-loop level contributions. We focus on how this asymmetry can be quantified and whether such a study would be feasible in the high luminosity phase of LHC.

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