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CP violating Higgs sector of MSSM

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Many couplings in the MSSM, like the tri-linear couplings, the mass parameter, mu, etc. could in general be complex quantities, leaving a CP-violating Higgs sector. In such case the physical Higgs bosons will not be CP-eigenstates, leading to very different phenomenology compared to the CP-conserving MSSM. We explore the di-photon decay channel of the Higgs bosons within this context at the LHC. The leading order term being a triangular loop of particles including the stop quark, we investigate the influence of a light stop in the process arising through the complex Higgs-stop-stop coupling. Our study show substantial deviation in the cross section from the CP-conserving case. The effect is somewhat enhanced with the production through gluon fusion included.

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