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Probing the CP properties of Higgs bosons via transverse polarization at $^{+-}$ collide

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In the CP-violating 2HDM, the CP-violating Higgs to fermions couplings can make an additional loop contribution on the Higgs to gauge bosons couplings. In order to address this aspect, we consider a generic model which has the effective CP-violation structure of the Higgs to gauge bosons couplings. We explore the effect of CP-violation term via the process $^{+-}\to$, $\to^{+-}$, where the angular distribution of muon pair can be sensitive to the CP-violation structure. In particular, the transverse polarization of the initial beams can be applied to single out the effect of CP-violating term compared to the unpolarized or longitudinally polarized beams. We discuss the set-up and the results for the differential cross section and the asymmetries with respect to the CP-odd observables with transverse polarization, at the future $^{+-}$ collider with center-of-mass energy 250 GeV.

Summary

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