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Electroweak baryogenesis in aligned two Higgs doublet model and collider phenomenology

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Electroweak baryogenesis is a promising scenario, which relies on electroweak symmetry breaking caused by the Higgs potential.
The detail of the Higgs potential would be revealed by the future high energy colliders, so that these are necessary to test the scenario of electroweak baryogenesis.
We have calculated the baryon number density in aligned two Higgs doublet model, in which coupling constants of the lightest Higgs boson with the mass of 125 GeV coincide with those in the standard model at tree level to satisfy the current LHC data [1,2].
In this model, the severe constraint from the electric dipole moment of electrons, which is normally difficult to be satisfied, can be avoided by destructive interferences between CP-violating phases in the model.
We will show some benchmark scenarios for electroweak baryogenesis in this model under the current available data and the basic theoretical bounds.
In addition, we will discuss various predictions for the future experiments such as HL-LHC and ILC.
[1] K. Enomoto, S. Kanemura and Y. Mura, JHEP 01 (2022) 104
[2] K. Enomoto, S. Kanemura and Y. Mura, JHEP 09 (2022) 121

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