

3HDM based on CP symmetry of order 4: the story so far

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CP4 3HDM is a peculiar three-Higgs-doublet model in which a single symmetry, the CP symmetry of order 4, leads to tight constraints on the scalar and Yukawa sectors. The model does not possess the decoupling limit; moreover, tree-level flavor-changing neutral couplings are unavoidable although they can be suppressed. Thus, it remains an open question if the model can pass experimental constraints or runs into immediate conflict with experiment. In this talk, I report on how well the experimental constraints on the scalar, Yukawa, and flavor sectors can be accommodated in this model. Interestingly, out of 8 possibilities, only one CP4-invariant Yukawa sector can pass these constraints in a rather narrow part of the parameter space and leads to very characteristic top-Higgs couplings to be fully probed in future.

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