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CP-violation in complex-singlet extension of 2HDM

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We explore the possibility of CP-violation in the complex-singlet extension of 2HDM. The addition of complex singlet paves the way for additional sources of CP-violation compared to 2HDM. If a Z_2 -symmetry is imposed on the complex-singlet, it can accommodate a dark matter candidate as well. We identify the regions of parameter space, that can fit DM observables and at the same time generate sufficient CP-violation. The amount of CP-violation gets severely constrained from electric-dipole moment experiments, which we take into account. We also consider all existing theoretical and experimental bounds on the model parameter space. Finally, we probe the CP-violation in this model at future collider experiments.

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