Contribution ID: **66** Type: **not specified**

CP-violation in the Weinberg 3HDM potential

Wednesday, September 24, 2025 11:00 AM (30 minutes)

We explore the phenomenology of Weinberg's Z2 times Z2 symmetric three-Higgs-doublet potential, allowing for spontaneous violation of CP due to complex vacuum expectation values. An overview of all possible ways of satisfying the stationary-point conditions is given, with one, two or three non-vanishing vacuum expectation values, together with conditions for CP conservation in terms of basis invariants. All possible ways of satisfying the conditions for CP conservation are given. Scans of allowed parameter regions are given, together with measures of CP violation, in terms of the invariants. The light states identified in an earlier paper are further explored in terms of their CP-violating couplings. Loop-induced CP violation in WWZ couplings, as well as charge-asymmetric scattering are also commented on.

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Session Classification: Plenary 10

Track Classification: Plenary