Contribution ID: **1190** Type: **BSM**

CP-Violation in 2HDM is Discrete, but Triple Higgs can Reveal

Tuesday 25 May 2021 15:15 (15 minutes)

We distinguish two separate sources of CP-violation in a 2HDM: in the CP properties of the mass eigenstates, and in their bosonic interactions. A systematic study of the interplay between Higgs alignment and CP-violation enables us to define a scenario where departures from Higgs alignment could be present independently of CP-violation. Without recourse to the typically required angular correlations or electric dipole moment signals, and considering current experimental constraints, we suggest a smoking-gun signal of CP-violation in the Higgs-to-Higgs decay, (h3 → h2h1), where h3,h2, and h1 are the heaviest, second heaviest and the SM-like neutral Higgs bosons, respectively. The mere presence of this decay channel, which is non-zero only away from the alignment limit, is sufficient to establish CP-violation in a complex two-Higgs-doublet model. A distinct discovery channel lies in final states with three 125 GeV Higgs bosons, which has yet to be searched for, and could be detected at the high-luminosity LHC.

Summary

Authors: WANG, xiaoping; LOW, Ian (Argonne National Lab/Northwestern Univ); Prof. SHAH, Nausheen (Wayne State University)

Presenter: WANG, xiaoping

Session Classification: Higgs I