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P-even, CP-violating Signals in Scalar-Mediated Processes

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New sources of neutral scalar-mediated CP violation that arise in extended Higgs sectors can originate in the Yukawa sector or in the structure of the scalar potential. Most treatments in the literature focus on CP-violating Yukawa interactions of neutral scalars, which is an example of P-odd CP violation since it derives from the mixing of two C-even operators of opposite sign P. In contrast, CP-violation arising from the scalar potential is P-even CP-violation, which can be observed by detecting three bosonic processes (suitably chosen) that are incompatible with the presence of a CP-symmetric scalar potential and/or vacuum. The discovery potential of such signals at various future multi-TeV lepton (and $\gamma\gamma$) colliders is assessed.

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