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(In)consistency of the Real 2HDM

Tuesday, September 23, 2025 4:00 PM (30 minutes)

The Real 2HDM with a softly-broken Z_2 symmetry is expected to receive divergent CP-violating radiative corrections from the CP phase in the CKM matrix, as emphasized by Fontes et al. four years ago. I will describe a new approach combining the properties of renormalization group equations, the momentum structure of divergences in Feynman diagrams, and approximate symmetries between individual diagrams that we used to demonstrate the cancellation of these CP-violating divergences through six loops. By identifying the couplings that break the approximate symmetries at seven loops, we can predict the leading parameter dependence of the divergent CP violation.

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