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Global Constraints on Yukawa Operators in the Standard Model Effective Theory

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CP-violating contributions to Higgs–fermion couplings are absent in the standard model of particle physics (SM) but are motivated by models of electroweak baryogenesis. In this talk, I will present results of a study of the constraints on these couplings from a combination of LHC data and experimental bounds on the electron, neutron, and mercury electric dipole moments (EDMs). While previous studies have focused on scenarios with CP-violation in the interaction of the Higgs with a single fermion species, we have undertaken global fits that allow for the presence of CP-violating contributions from several fermion species simultaneously. I will show that allowing for these multiple CP-violating interactions can substantially relax previously presented constraints from EDMs. However, particularly for the case where there is only CP violation in the couplings with the third-generation fermions, non-trivial correlations between EDM and LHC results can persist even in this more complicated parameter space.

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