Contribution ID: **316** Type: **Parallel talk**

CP-Violating Invariants in the SMEFT

Thursday 5 May 2022 12:30 (20 minutes)

In the Standard Model, CP violation in the Electroweak sector is parametrized by the Jarlskog Invariant. This is the order parameter of CP-violation, in the sense that it vanishes iff CP is conserved. When higher dimensional operators are allowed, and the Standard Model Effective Field Theory is constructed, numerous new sources for CP violation can appear. However, the description of CP violation as a collective effect, present in the SM, is inherited by its Effective extension.
Here, I argue that such a behaviour has to be captured, at dimension 6, by flavor invariant, CP violating objects, linear in the Wilson coefficients. Such a description ensures that CP violation in the SMEFT is treated in a basis independent manner. In particular, I claim these are the objects that have to vanish, together with the SM Jarlskog Invariant, for CP to be conserved, and viceversa. The scaling properties of these invariants demonstrates that, while CP is not an accidental symmetry of the Standard Model, its breaking is accidentally small at the renormalizable level.

Submitted on behalf of a Collaboration?

No

Authors: GENDY ABD EL SAYED, Emanuele; GROJEAN, Christophe (DESY (Hamburg) and Humboldt University (Berlin)); RUDERMAN, Joshua (Princeton University); BONNEFOY, Quentin (DESY)

Presenter: GENDY ABD EL SAYED, Emanuele

Session Classification: WG3: Electroweak Physics and Beyond the Standard Model

Track Classification: WG3: Electroweak Physics and Beyond the Standard Model