

Symmetry-restoring finite counter-terms of SMEFT four-fermion operator insertions at one-loop

Tuesday 22 April 2025 11:44 (22 minutes)

Some effects induced by SMEFT operators at one-loop have been fully computed, in particular, the renormalization of divergences by physical operators in single insertions of dimension-six operators. Important non-logarithmically enhanced contributions remain to be calculated. We discuss dimensional regularization in the Breitenlohner-Maison 't Hooft-Veltman scheme. The goal here consists of determining in this scheme unexplored quantum effects in chiral theories at one-loop. Namely, the determination of finite counter terms that reestablish the Slavnov-Taylor identities at one-loop. These counter terms are necessary due to the presence of evanescent symmetry-breaking terms in the classical Lagrangian, that are needed to regularize fermion propagators. We consider a technique that allows an easier automation in the calculation of such finite effects. We focus on dimension-six four-fermion operators, and as expected find no obstructions to the Slavnov-Taylor identities that cannot be cured by finite counter-terms. We briefly point out phenomenological implications for higher order calculations.

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Session Classification: Collider

Track Classification: Plenary talk