

PARTICLEFACE 2021: Unraveling New Physics Workshop & Management Committee Meeting



Contribution ID: 15

Type: **Submitted Talk**

Chiral Theories in Dimensional regularization and Breitenlohner-Maison/'t Hooft-Veltman scheme: application to chiral QED at 2-loops

Thursday 15 July 2021 16:00 (30 minutes)

Dimensional regularization and renormalization in the Breitenlohner-Maison/'t Hooft-Veltman scheme, proved to be consistent at all loop orders, is a scheme that is widely used in phenomenological applications of (non-supersymmetric) QFTs. When being employed for theories with chiral fermions, however, the chiral and the BRST symmetries become broken, due to the specific γ_5 treatment.

In this talk I present our latest work on the application of algebraic renormalization methods to resolve this problem, illustrated on the specific example of a chiral U(1) (QED) model, up to the two-loop level. We calculate the unambiguous set of BRST-restoring local finite counterterms, that restore the BRST symmetry and ensures the consistency of this model in the dimensional scheme.

This talk is based on one upcoming publication, and on our recent publication (1-loop): arXiv:2004.14398 (published in JHEP 08 (2020) 08, 024).

Primary author: Dr BÉLUSCA-MAĪTO, Hermès (Department of Physics, Faculty of Sciences, University of Zagreb)

Co-authors: Prof. ILAKOVAC, Amon (Department of Physics, Faculty of Sciences, University of Zagreb); Mr KÜHLER, Paul (Institut für Kern- und Teilchenphysik, TU Dresden); Ms MAĐOR-BOŽINOVIĆ, Marija (Department of Physics, Faculty of Sciences, University of Zagreb); STOECKINGER, Dominik (TU Dresden)

Presenter: Dr BÉLUSCA-MAĪTO, Hermès (Department of Physics, Faculty of Sciences, University of Zagreb)

Session Classification: Working Group Meeting