Contribution ID: **45** Type: **not specified**

Electroweak renormalization based on gauge-invariant vacuum expectation values of non-linear Higgs representations in the Standard Model and beyond

Friday 29 April 2022 17:30 (30 minutes)

Although the advanced concepts and techniques of perturbative QFT still apply to models with extended Higgs sectors, new issues arise, such as the question about phenomenoligically sound renormalization and input-parameter schemes, which fulfill desirable theoretical requirements (gauge invariance, perturbative stability, symmetries, simplicity, etc.), which are prerequisites for a confrontation of theory and experiment at the precision level. Moreover, there are non-trivial problems in the renormalization of vacuum expectation values (tadoles) if MSbar-renormalized parameters related to masses (running masses and Higgs mixing angles) are used, even in the Standard Model (SM).
In this talk these issues are discussed and exemplified for the Two-Higgs-Doublet Model and for a Singlet Extensions of the SM in particular. Old and new renormalization schemes are discussed and illustrated in applications to some Higgs-boson production and decay processes. In particular, a new concept for the renormalization of vacuum expectation values is introduced that is based on non-linear representations of scalar sectors.

Primary author: DITTMAIER, Stefan (University of Freiburg)

Presenter: DITTMAIER, Stefan (University of Freiburg)

Session Classification: Parallel 10