

Scalars 2017



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Off-shell renormalization of dimension 6 operators in Higgs effective field theories

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Content :

The off-shell one-loop renormalization of a Higgs effective field theory with a sextic scalar potential is presented. This is achieved by renormalizing the theory once reformulated in terms of two auxiliary fields, allowing to diagrammatically separate the SM and BSM contributions to 1-PI amplitudes. Invariance under an extended Becchi-Rouet-Stora-Tyutin symmetry guarantees the physical equivalence with the standard formalism as well as the existence of some functional identities, constraining the dependence on the additional auxiliary fields. The latter allow in turn the explicit derivation of the mapping onto the original theory. We elaborate on some phenomenological consequences of our results, as well as provide the generalization of the method to potentials involving operators of arbitrary higher powers in the scalar field.

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