

## Phenomenological analysis of the effective extensions of BSM scenarios

The spectrum of the new physics beyond the Standard Model is very likely to be non-degenerate with few light non-SM particles residing close to the electroweak scale. The effect of the more complete theory then can be captured through an effective extension of the BSM scenario treating the new non-SM particles on the same footing along with the SM ones. To perform a detailed phenomenological analysis of such cases, one needs to be familiar with the proper structures of the higher dimensional operators constituted of the SM degrees of freedoms and the minimal extension. We consider two different scalar extensions of the SM and their effective field-theoretic generalisations. We demonstrate the method to construct the gauge-invariant forms of the effective operators and present the operator structures for these two cases. We also investigate their impacts on the low-energy observables, such as precision measurements of the anomalous magnetic moment of the muon, precision Higgs measurements, and direct collider sensitivity to charged Higgs searches.

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