

NEW PERSPECTIVES IN CONFORMAL FIELD THEORY AND GRAVITY

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One-loop IR/UV dictionary in the SMEFT

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Effective field theories offer a rationale for the classification of heavy new physics models based on the size of their contribution to the effective Lagrangian and therefore to experimental observables. When trying to connect theory with experiment, dictionaries which relate possible UV scenarios with the relevant effective interactions are of utmost importance.

In this talk, I will report on the first step towards the calculation of the one-loop, dimension 6 IR/UV dictionary in the SMEFT. We consider dimension-six operators in the SMEFT that cannot be generated at tree-level in weakly-coupled extensions of the Standard Model, meaning that their leading contribution arises at one-loop. These correspond to operators with field strength tensors, all of which can have important phenomenological consequences. We provide a complete classification of renormalizable extensions of the Standard Model with new scalar and fermion fields that contribute to these operators at one-loop order, together with their explicit contribution. These results are encoded in a Mathematica package called SOLD.

Summary

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