

## Exploring GUT origins of SMEFT operators

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In the precision frontier, effective field theories have been widely used to describe the new physics effects in a model independent way. It is intriguing to find ultraviolet (UV) theories that generate certain effective operators in the low energy regime, but the traditional way of integrating out heavy fields requires individual studies of UV models, which can be at odds with the bottom-up philosophy of effective field theories. In this report, we provide a purely bottom-up approach based on the  $j$ -basis analysis to explore the possible tree-level UV origins of higher dimensional effective operators, especially the baryon/lepton number violating ones. In particular, for vector resonances, we study their potential identity as gauge bosons in a Grand Unified Theory (GUT).

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