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Effective Lagrangian Approach to Top Decay via Flavor Changing Neutral Current

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Summary

We study possible non-standard $t u Z$ and $t c Z$ interactions, which induce flavor-changing neutral-current decays of the top quark, in the effective-Lagrangian framework. The corresponding Lagrangian consists of four kinds of non-standard couplings coming from $SU(3) \times SU(2) \times U(1)$ invariant dimension-6 effective operators. The four coupling constants in each interaction are treated as complex numbers independent of each other, and constraints on them are derived by using the present experimental limits of the branching fractions for $t \rightarrow u Z$ and $t \rightarrow c Z$ processes. Future improvements of those constraints are also discussed as well as possibilities of measurements of these couplings at the High-Luminosity Large Hadron Collider. In addition, correlations of non-standard couplings reproducing experimental results are presented.

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