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Gluonic Operators and Lepton Flavor Violation at the LHC

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We examine the charged lepton flavor violating process $gg \rightarrow \mu\tau$ at the $\sqrt{s} = 13$ TeV LHC. Operators generating this process can be induced by new physics at dimension 8. Despite the power suppression associated with dimension 8 operators, we show that the LHC's large gluon luminosity makes it possible to probe this channel. For an integrated luminosity of 100 fb⁻¹ at the LHC, we predict a constraint on the NP scale $\Lambda > 3$ TeV. In addition, we point out that such operators can be induced through top quark loops in models that generate dimension 6 operators of the form $t\bar{t}\mu\tau$. We find that the NP scale of these dimension 6 operators can be constrained to be $\Lambda > 3.4-4.1$ TeV with 100 fb⁻¹ of data.

Summary

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