

## Collider sensitivity to SMEFT heavy-quark operators at one-loop in top-quark processes

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We study the effects of four-heavy-quark operators in the production of top quarks in the framework of the Standard Model Effective Field Theory (SMEFT) at the LHC. In particular, we compute for the first time the total contribution of the four-top-quark operator which enters only at the one-loop level in the top-quark pair production process. Analytical results at one-loop are presented for the gluon- and quark-initiated subprocesses, which allowed a first complete validation of the SMEFT@NLO in Madgraph5\_aMC@NLO. The 95% CL bounds on four-heavy-quark operators from the available top-quark pair and four-top-quark production data are provided, which are complementary to other bounds found in the literature. We focus on the comparison of the sensitivities of the top-quark pair and the four-top-quark production processes, where in the latter case the four-top-quark operator contributes at tree-level. We conclude that the sensitivities of the two processes to four-heavy-quark operators are comparable. The projected sensitivities of both processes at HL-LHC are also presented.

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