An Effective Field Theory approach using top quark polarisation and spin correlations in $t\bar{t}$ production at the LHC

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The Effective Field Theory (EFT) approach provides a systematic and model-independent way to search for new physics. It assumes that new interactions manifest at higher energies due to new particles that are not produced on-shell at the LHC. Their effects are parametrized by effective interactions that can interfere with Standard Model (SM) processes. By that, anomalous couplings can be identified and measured as small deviations from the SM predictions.

In this study, we aim to use sets of observables related to the top quark polarisation and spin correlation to determine limits on the anomalous couplings with unprecedented precision in dileptonic-decayed top-quark pairs. Each of these sets are sensitive to different couplings, providing a handful-way of separating the ones that, due to their symmetries properties, are uncorrelated with each other. In order to facilitate comparisons with other EFT studies, a basis translation to the Warsaw basis is desirable. In this work we study the sensitivity of observables using the *dim6top* and *SMEFTatNLO* UFO models in Monte Carlo simulations of dileptonic decayed $t\bar{t}$ events. Those events are also used to verify such basis translation. Our conclusions will pave the way for the EFT interpretation of ongoing measurements of the dileptonic-decayed top-quark pair events in the full Run 2 of the CMS detector.