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The Four-Fermi Interaction in the Standard Model Effective Theory

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The Standard Model Effective Theory (SMEFT) is a powerful tool to constrain physics beyond the Standard Model through data, without making restricting assumptions about the nature of the UV theory.
Even though there has been a lot of work put into constraining many of the dimension 6 operators, the large subset of four-Fermi operators has been wildly neglected in NLO analysis, due to SMEFT being a non-classically renormalizable theory. We present an investigation into the treatment of the renormalization procedure in combination with dimensional regularization and specifically a recipe how to treat \gamma_5 in a self-consistent way, while preserving all relevant Ward identities.
Furthermore, as an application of our newly compiled techniques, we present bounds on a number of four-Fermi Wilson coefficients derived through considering Top quark decay helicity fractions as well comparing well-measured low energy observables (namely Z boson partial widths and the effective weak mixing angle) to their SMEFT predictions.

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