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Including Dimension-8 Effects in SMEFT: Renormalization, and Phenomenology

Recent studies in the Standard Model Effective Field Theory (SMEFT) highlight the importance of consistently retaining terms of order $O(1/\Lambda^4)$ in theoretical predictions. In this presentation, we analyze SMEFT at $O(1/\Lambda^4)$, including 1-loop renormalization group evolution (RGE) effects arising from the scale dependence of Wilson coefficients, with explicit incorporation of dimension-8 operators. We review the current status of dimension-8 renormalization and summarize recent progress in the computation of SMEFT RGEs. Finally, we investigate the phenomenological impact of Wilson-coefficient running within both a bottom-up EFT framework and a model-dependent top-down approach.

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