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Hot news on: The Phase Structure of the SMEFT

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We perform dimensional reduction of the electroweak sector of the dimension-six SMEFT to order $\mathcal{O}(g^4)$ in coupling constants g . This analysis includes one-loop contributions to kinetic terms and quartic couplings; as well as two-loop contributions, where operators such as four-fermion interactions first appear, to squared mass terms. Using lattice data, we also provide evidence that, in contrast with previous statements in the literature, the SMEFT may undergo a first-order electroweak phase transition even without significant direct modifications of the Higgs potential at zero temperature.

Abstract

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