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Influence of additional dimension-4 scalar operators on asymptotic safety in the Litim-Sannino model

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We consider a four-dimensional $SU(N_c)$ gauge theory coupled to N_f species of color fermions and N_f^2 colorless scalars. Compared to previous studies, we have included all possible trilinar and quartic scalar operators. In the regime where asymptotic freedom is absent, we determine all interacting fixed points using perturbation theory up to three loop in the gauge and two loop in the Yukawa and scalar couplings. We compared these results with those obtained previously \cite{Bednyakov:2023asy} without adding additional scalar operators. Moreover classical and quantum stability of the vacuum is discussed as well as the spectrum of anomalous dimensions of various operators.

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