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IR fitness of the effective potential in the \hbar -expansion (12'+3')

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Perturbative calculations of the effective potential evaluated at a broken minimum, V_{\min} , are plagued by difficulties. Even though this quantity is physical, it is not straightforward to get a finite and gauge invariant result. In fact, the methods proposed to deal with these two issues are orthogonal in their approaches. Gauge dependence is dealt with through the \hbar -expansion, which establishes and maintains a strict loop-order separation of terms. On the other hand, IR divergences seem to require a resummation, which mixes the different loop orders. In this talk I discuss these methods for Fermi gauge Abelian Higgs at 2 loops. I discuss why the resummation procedure is not capable of removing all divergences. I show how the \hbar -expansion is able to deal with both the issues of IR divergences and gauge dependence.

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