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An analysis of the regularization scheme dependence in low-energy effective field theories

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Low-energy models are often used to study properties of strong-interaction matter, in particular at low temperatures. We investigate regularization scheme dependences of the quark-meson model in the mean-field and local potential approximation. To this end, we work out a meaningful comparison procedure for calculations with different regularization schemes using renormalization-group consistency. In the mean-field approximation, comparability can trivially be achieved and we find no regularization scheme dependence at all. In the local potential approximation comparability is non-trivial, but where a comparison is possible, regularization scheme artefacts are found to be small.

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