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Explicit renormalization of the nucleon-nucleon interaction in chiral EFT with a finite cutoff

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Nucleon-nucleon interaction
is studied within chiral effective field theory with a finite cutoff
at next-to-leading order in the chiral expansion.
The leading order interaction is resummed in a non-perturbative manner,
whereas the next-to-leading-order terms are treated perturbatively.
Some aspects of renormalizability of such a scheme are addressed.
In particular, it is analyzed whether the power-counting
breaking terms originating from the integration regions with momenta of the order
of the cutoff can be absorbed by the renormalization of the
low energy constants corresponding to the leading contact interactions.
The cutoff dependence of the scheme is also studied.

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