

Abstract Submitted
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Renormalization in the Three-Body Sector with Singular Potentials DANIEL ODELL, University of Tennessee, Ohio University, ARNOLDAS DELTUVA, Institute of Theoretical Physics and Astronomy, Vilnius University, JOSE BONILLA, University of Tennessee, LUCAS PLATTER, University of Tennessee, Oak Ridge National Laboratory — Despite the success of chiral effective field theory (EFT) in describing the nuclear interaction, there remains a significant debate over the power-counting scheme used to systematize the contributions. One-pion exchange (OPE) is part of the leading-order chiral EFT nucleon-nucleon potential, so we study the case of the attractive, inverse-cube potential, whose wave functions should have the same short-distance behavior. In principle, the renormalization at large cutoffs of two- and three-body observables found with this potential should mimic the cutoff dependence of those same observables calculated with OPE. I will present results that demonstrate the sufficiency of a two-body contact term to renormalize three-body binding energies and scattering observables. I will also discuss a rigorous analysis of the higher-order corrections that finds two-body corrections subleading to three-body corrections, suggesting that a three-body counterterm may be required at next-to-leading order.

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