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Revisting the Density Matrix Expansion with Regulated Chiral Interactions ALEXANDER DYHDALO, RICHARD FURNSTAHL, Ohio State University - Columbus, SCOTT BOGNER, Michigan State University, NICOLAS SCHUNCK, RODRIGO NAVARRO PEREZ, Lawrence Livermore National Lab — The density matrix expansion provides a general way to map microscopic interactions to a local functional. Previous density matrix expansion formulations added unregulated chiral long-range potentials to a Skyrme-type functional, which accounted for the short-range contributions. We implement the expansion with new coordinate space regulators using the regulator cutoff as a tool to adiabatically turn on finite-range pion interactions. We discuss 'smoking guns' for correct inclusion of 3-body forces, which are implemented in a normal-ordering prescription, and compare to ab initio calculations.

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