Abstract Submitted
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Two- and Three-Nucleon Chiral Interactions in Quantum Monte Carlo Calculations for Nuclear Physics[1] JOEL LYNN, JOSEPH CARLSON, STEFANO GANDOLFI, Los Alamos National Laboratory, ALEXANDROS GEZERLIS, University of Guelph, KEVIN SCHMIDT, Arizona State University, ACHIM SCHWENK, INGO TEWS, Technische Universität Darmstadt — I present our recent work on Green's function Monte Carlo (GFMC) calculations of light nuclei using local two- and three-nucleon interactions derived from chiral effective field theory (EFT) up to next-to-next-to-leading order (N2LO). GFMC provides important benchmarking capabilities for other methods which rely on techniques to soften the nuclear interaction and also allows for nonperturbative studies of the convergence of the chiral EFT expansion. I discuss the choice of observables we make to fit the two low-energy constants which enter in the three-nucleon sector at N2LO: the ^{4}He binding energy and n–α elastic scattering P-wave phase shifts. I then show some results for light nuclei. I also show our results for the energy per neutron in pure neutron matter using the auxiliary-field diffusion Monte Carlo method and discuss regulator choices. Finally I discuss some exciting future projects which are now possible.

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Joel Lynn
Los Alamos National Laboratory

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