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S. Gandolfi, J. Carlson, D. Lonardoni, X. Wang T-2: Towards the exact calculation of medium nuclei

The prediction of the structure of light and medium nuclei is crucial to test our knowledge of nuclear interactions. The calculation of the nuclei from two- and three-nucleon interactions obtained from first principle is, however, one of the most challenging problems for many-body nuclear physics.

- We have calculated several properties, including energy and radii of nuclei up to $A=48$, using realistic nuclear Hamiltonians derived within the framework of chiral effective field theory.
- We have also begin to calculate one and two-body momentum distributions. These quantities are fundamental to calculate electron- and neutrino-scattering at large energies and momenta. In the left panels we show the one body momentum distribution of ^{16}O obtained using different interactions, and a comparison of the (rescaled) one-body momentum distribution of ^4He and ^{16}O .

- J. E. Lynn, I. Tews, J. Carlson, S. Gandolfi, A. Gezerlis, K. E. Schmidt, A. Schwenk, *Chiral Three-Nucleon Interactions in Light Nuclei, Neutron-alpha Scattering, and Neutron Matter*, Phys. Rev. Lett. 116, 062501 (2016).

- J. Carlson, S. Gandolfi, D. Lonardoni, X. Wang, *Momentum distributions in nuclei*, in preparation.

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