Abstract Submitted
for the APR07 Meeting of
The American Physical Society

Structure of p-shell nuclei with two- plus three-nucleon interactions from chiral effective field theory[1] PETR NAVRATIL, VESSELIN GUEORGUIEV, LLNL, JAMES VARY, ISU, ERICH ORMAND, LLNL, ANDREAS NOGGA, Forschungszentrum Julich — Properties of finite nuclei are evaluated with two-nucleon (NN) and three-nucleon (NNN) interactions derived within chiral effective field theory (EFT). The nuclear Hamiltonian is fixed by properties of the $A = 2$ system, except for two low-energy constants (LECs) that parameterize the short range NNN interaction. We constrain those two LECs by a fit to the $A = 3$ system binding energy and investigate sensitivity of ^{4}He, ^{6}Li, ^{10,11}B and ^{12,13}C properties to the variation of the constrained LECs. We identify a preferred choice that gives globally the best description. We demonstrate that the NNN interaction terms significantly improve the binding energies and spectra of mid-p-shell nuclei not just with the preferred choice of the LECs but even within a wide range of the constrained LECs. At the same time, we find that a very high quality description of these nuclei requires further improvements to the chiral Hamiltonian.

[1]This work was partly performed under the auspices of the U. S. Department of Energy by the University of California, Lawrence Livermore National Laboratory under contract No. W-7405-Eng-48.

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Date submitted: 12 Jan 2007 Electronic form version 1.4