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Structure of Light Nuclei Using Chiral Three-Nucleon Interaction.¹ V.G. GUEORGUIEV, P. NAVRATIL, Lawrence Livermore National Laboratory, J.P. VARY, Iowa State University, W.E. ORMAND, Lawrence Livermore National Laboratory — Modern high-precision nucleon-nucleon (NN) interactions adjusted to reproduce the phase shifts in the two nucleon system need to be augmented by three-nucleon interactions (TNI) in order to reproduce properties of multi nucleon systems. Chiral perturbation theory (χPT) at next-to-next-to-leading order (N²LO) predicts three types of TNI terms. A two-pion exchange term, which is frequently used, has parameters determined from the two-nucleon χPT -potential and/or pion-nucleon scattering data. The other two terms, the one-pion exchange with NN-contact term and the NNN-contact term, are accompanied by undetermined low-energy constants. We include all three TNI terms in *ab initio* no-core shell model (NCSM) calculations. The two undetermined TNI constants are fit to binding energies of *s*-shell nuclei. The effect on the nuclear structure of adding N²LO TNI is then studied in NCSM calculations for *p*-shell nuclei, such as ^{10,11}B and ^{12,13}C that are particularly sensitive to the presence of and the form of the TNI.

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