Consistent Renormalization of NN Interactions and Operators\textsuperscript{1} 
ROBERT BASILI, WEIJIE DU, SOHAM PAL, SHIPLU SARKER, PIETER MARIS, JAMES VARY, Iowa State University — We investigate the effects of consistent renormalization on observables for bound states of two nucleon systems, both the deuteron and systems within external harmonic traps. The observables under investigation are the Hamiltonian, root-mean-square radius, electric quadrupole moment, magnetic dipole moment, Gamow-Teller decay, and neutrinoless double $\beta$-decay. We renormalize these operators to different model P-spaces by the Okubo-Lee-Suzuki (OLS) transformation. We adopt the chiral effective field theory (EFT) NN interactions available up to N4LO (E. Epelbaum, H. Krebs and U. G. Meissner, Phys. Rev. Lett. 115, 122301 (2015)). For the neutrinoless double $\beta$-decay operator we implement a chiral EFT operator through NLO (G. Prezeau, M. Ramsey-Musolf and P. Vogel, Phys. Rev. D 68, (2003)), whereas for the other observables, we use bare operators. We show the differences of each effective operator from its corresponding bare operator in the model P-spaces.

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