

Abstract Submitted
for the DNP20 Meeting of
The American Physical Society

Examining isospin-mixing in the sd shell using new isospin-breaking “USD” Hamiltonians¹ AARON MAGILLIGAN, B. ALEX BROWN, Michigan State University — Two new USD-type Hamiltonians, USDC and USDI, have been developed [1] that directly incorporate Coulomb and other isospin-breaking interactions. Starting from ab initio interactions, linear combinations of two-body matrix elements were constrained by experimental energy levels in sd -shell nuclei. With this method, binding energies and excitation energies of proton-rich nuclei in the shell can be added to the data set used in the fit. USDC is based on the same renormalized G matrix used in the derivation of previous USD-type Hamiltonians, while USDI is derived from in-medium similarity renormalization group (IMSRG) interactions. Both contain an analytic Coulomb interaction with Miller-Spencer short-range correlations and an effective isotensor interaction. These Hamiltonians are used to examine isospin-level mixing, Thomas-Ehrman shifts, and other properties of sd -shell nuclei.

[1] A. Magilligan and B. A. Brown, Phys. Rev. C **101**, 064312 (2020)

¹We acknowledge support from NSF grant PHY-1811855

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Date submitted: 26 Jun 2020

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