Abstract Submitted
for the DNP17 Meeting of
The American Physical Society

Realistic calculations for c-coefficients of the isobaric mass multiplet equation in $1p0f$ shell nuclei[1] ERICH ORMAND, Lawrence Livermore National Laboratory, ALEX BROWN, MORTEN HJORTH-JENSEN, Michigan State University — We present calculations for the c-coefficients of the isobaric mass multiplet equation for nuclei from $A = 42$ to $A = 54$ based on two-body effective interactions derived from three realistic nucleon-nucleon interactions: CD-Bonn, N^{3}LO, and Argonne V18. The two-body effective interactions were derived using G-matrix or $V_{low\ k}$ augmented by perturbation theory extended to third order. We demonstrate a clear dependence in the c-coefficients on the short-ranged charge-symmetry breaking (CSB) part of the strong interaction, which is required to reproduce their overall behavior as a function of excitation (angular momentum). We find, however, that the CSB component in all three realistic nucleon-nucleon interactions is too large when compared to experiment, and that, furthermore, there is significant disagreement between each of the three interactions. This implies either: 1) a deficiency in our understanding of isospin-symmetry breaking in the nucleon-nucleon interaction, 2) significant isospin-symmetry breaking in the initial three-nucleon interaction, or 3) large contributions to isospin-symmetry breaking in three-nucleon interactions induced by the renormalization procedure.

[1]This work performed for the U.S. DOE by LLNL under Contract DE-AC52-07NA27344. WEO: DOE/NP FWP SCW0498. BAB: NSF Grant No. PHY-1404442. MHJ: NSF Grant No. PHY-1404159 and the Research Council of Norway contract ISP-Fysikk/216699

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Date submitted: 28 Jun 2017 Electronic form version 1.4