Abstract Submitted
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Anatomy of an Inversion-46Ar LARRY ZAMICK, Rutgers University, SHADOW ROBINSON, Millsaps College, YITZHAK SHARON, Rutgers University — Two different interactions give very close results for properties of most even-even Ar isotopes, but for ^{46}Arthe results diverge. The interactions in question are a). WBT and b). SPDF-U. For ^{42,44,46}Ar the results are as follows : WBT E(2_1+) (1.29,1.17,1.14) MeV E(2_2+) (2.32,1.80,2.10) MeV g(2_1+) (-.095,-.022,+.100) g(2_2+) (.096,.045,-.070) SPDF-U E(2_1+) (1.15,1.09,1.59) MeV E(2_2+) (2.28,1.78,3.77) MeV g(2_1+) (-.084,-.040,+.513) g(2_2+) (+.075,+.346,+.514) To understand the big differences for A=46 we must look to the odd K isotopes. Consider the J=$3/2^+$—J=$1/2^+$ splitting.(MeV) EXPT/WBT/SPDF-U A=43 0.561,1.109,0.672 A=45 0.474, 0.871 ,0.345 A=47 -0.360,0.507,-0.320 A=49 0.200,0.729,0.078 We see that there is an inversion in the "$d_{3/2}$ - $s_{1/2}$" splitting for ^{47}K. The SPDF-U interaction successfully gives this inversion but WBT does not. Things are a bit different for B(E2,0_1-2_1).The values in e^2fm^4 are WBT (338,425,541) /SPDF-U (351,357,525). Here the 2 interactions give very similar results. Both interactions yield a larger B(E2) for ^{46}Ar than for ^{44}Ar, as do previous calculations by others. This despite the fact that in single j A=46 has a closed shell of neutrons. Most experimental measurements had the opposite –larger B(E2) for A=44 than for A=46. But a most recent measurement by Mengone et al. disagrees with all previous measurements and agrees with the current shell model calculations.

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