Abstract Submitted
for the DNP10 Meeting of
The American Physical Society

Ratio of Isoscalar to Isovector Core Polarization Contributions to Magnetic Moments SHADOW ROBINSON, Millsaps College, LARRY ZAMICK, YITZHAK SHARON, Rutgers University — We found that large scale calculations of isoscalar magnetic moments of odd-odd N=Z nuclei yielded results remarkably similar to those of simple single j calculations. To understand why we use a delta interaction times (1+xPs) where Ps is the spin exchange operator, to calculate the ratio IS/IV of the core polarization contributions to the magnetic moments. The spin exchange contributes a factor (1-2x) to this ratio. A popular choice is x=1/3 for which (1-2x) is also 1/3. Another contribution comes from the fact that the coupling of j=l+1/2 to j'=l-1/2 via the magnetic moment operator is proportional to (gs-gl). The IS values are gl=0.5 gs=0.88; the IV values are 0.5 and 4.71. This yields a (gs-gl) ratio of 0.09 which together with the 1/3 from spin exchange tells us that the isoscalar core polarization is a mere 3% of isovector. If we further divide by single j values to get effective charge corrections then the ration IS/IV ends up being 0.06 (or 6%). We thus gain understanding of the resuts in ref [1] of the near equality of large scale and single j results for IS moments.

[1] S.Yeager, S.J.Q. Robinson, L.Zamick and Y.Y.Sharon, EPL 88, 52001 (2009)

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Date submitted: 09 Jul 2010 Electronic form version 1.4