Abstract Submitted
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Precision measurements of electromagnetic matrix elements as a test of Ab-Initio calculations in light nuclei E.A. MCCUTCHAN, C.J. LISTER, M.P. CARPENTER, R.V.F. JANSSENS, T.L. KHOO, T. LAURITSEN, E.F. MOORE, D. SEWERYNIAK, S. ZHU, Physics Division, Argonne National Laboratory, Argonne, IL 60439 — Recent ab-initio shell model calculations of light nuclei have underlined the importance of 3-body forces. Gamma-ray spectroscopy of certain excited states in light nuclei can test new formulations of the interaction, as both the diagonal and off diagonal matrix elements are sensitive to it. A particularly interesting set of cases lie in the A = 10 systems, ^{10}Be, ^{10}B, and ^{10}C, where the inclusion of 3-body forces is found to invert the sequence of states. This has been attributed to the important contribution of the 3-body interactions to the overall spin-orbit force. Precise (<10%) matrix elements are needed to challenge the latest calculations, requiring a new generation of improved experiments. Lifetimes of excited levels in A = 10 nuclei, populated in the ^{6}Li(^{6}Li, xpxn) reaction, will be determined using high velocity DSAM lineshape measurements. Preliminary results of the experiment will be presented and discussed in terms of recent ab-initio shell model calculations. This research was supported by the DOE Office of Nuclear Physics under contract DE-AC02-06CH11357.

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