

The $^3\text{He}(e, e'NN)$ Reaction

The Hall-A and HARP Collaborations

Spokespersons

- *M.B. Epstein, California State University, LA*
- *R.A. Lindgren, University of Virginia*
- *G.J. Lolos, University of Regina*
- *Z.E. Meziani, Stanford University*
- *Z. Papandreou, The George Washington University*

ABSTRACT

We propose to study the two-nucleon knockout reactions $^3\text{He}(e, e'np)$ and $^3\text{He}(e, e'pp)$ in order to investigate the two- and three-body absorption strength, and short-range correlations in nuclei. The ^3He nucleus is selected because it is the lightest non-trivial nuclear system for which realistic wave functions are available, and a triple coincidence renders the experiment kinematically complete. We plan to measure in configurations where the kinematics may permit a simplified interpretation of the data, by selectively emphasizing the various components of the reaction mechanism. An L/T separation is essential in untangling MEC and IC effects, and will be performed as well. We plan to carry out these measurements using the 1-4 GeV CW electron beam at CEBAF and the two high resolution spectrometers in Hall-A for detecting electrons and protons. The third detector arm, which will detect protons and neutrons simultaneously (and thus allow the simultaneous measurement of the above mentioned reactions), will be the High Acceptance Recoil Polarimeter (HARP). HARP, combined with a high power cryogenic ^3He target, is capable of operating at luminosities of $10^{38} \text{ cm}^{-2}\text{s}^{-1}$, making this experiment feasible.