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Proposal to the CEBAF PAC6

**Search for  $\Delta^{++}(1232)$  Components in the  $^3\text{He}$  Ground State**

H. Baghaei (co-spokesman), R. A. Lindgren, R. W. Lourie, B. Gladyshev,  
R. Sealock, C. Smith, S. Thornton, and S. Van Verst

*University of Virginia, Charlottesville, VA*

F. W. Hersman (co-spokesman), J. Calarco, T. Smith, I. The, J. Distelbrink

*University of New Hampshire, Durnham, NH*

V. Burkert, M. D. Mestayer, and E. S. Smith

*CEBAF, Newport News, VA*

L. C. Dennis

*Florida State University, Tallahassee, FL*

R. A. Miskimen

*University of Massachusetts, Amherst, MA*

J. M. Laget

*Saclay*

The HALL B Collaboration

## Abstract

We propose to use the CEBAF Large Acceptance Spectrometer (CLAS) to search for pre-existing  $\Delta^{++}(1232)$ -isobars in the  ${}^3\text{He}$  ground state. Theoretical calculations predict the presence of a small percentage of the  $\Delta$ -isobar components in the ground state wave function of few-body systems. However, the existing experimental results are inconclusive, mainly due to the uncertainties in the evaluation of the background (produced  $\Delta$ ) contributions. We propose to study the triple coincidence  ${}^3\vec{H}e(\vec{e}, e'p\pi^+)$  reaction in order to minimize these background contributions (there is no one-step  $\Delta^{++}$  production). A polarized helium target allows a simultaneous measurement of cross sections and asymmetries. The distribution of the coincidence cross section over the acceptance of the CLAS characterizes the initial momentum distribution, while the asymmetry identifies the longitudinal piece associated with knockout. We request 300 hours of beam time at an energy of 4.0 GeV.