

CEBAF EXPERIMENT 89-043

*Measurements of the Electroproduction of the $\Delta(gnd)$,
 $\Delta^*(1520)$ and $f_0(975)$ via the
 $K^+ K^- p$ and $K^+ \pi^- p$ Final States*

L. Dennis, H. Funsten, Spokespersons

It is proposed to use the CEBAF Large Acceptance Spectrometer (CLAS) in a series of measurements to study exclusive electroproduction and charged hadronic decay of the $f_0(975)$ resonance and low-mass Λ^* . Hadron polarization and interference effects will be determined by measurement of the decay angular distribution multipole moments. In addition to the $K^+ K^- p$ and $K^+ \pi^- p$ final states, the $\pi^+ \pi^-$ decay mode of the f_0 will also be measured to allow a coupled channel analysis in the $\bar{K}K$ threshold region. The resulting measurements will:

i) test models of the structure of the $f_0(975)$, the lowest mass isoscalar member of the scalar meson nonet. Is it a "conventional" $^3P_0 \bar{q}q$ system modified by K thresholds, or a member of a group of 4 quark states, or possible a unique "mesonic nucleus"-like $(\bar{q}q) - (\bar{q}q)$ system;

ii) determine which hadronic s, t, and u channel contributions are important in ΛK^+ production by using final state Λ polarization to help isolate specific contributions.

These measurements, which will detect three of the four charged particle final states, are proposed as first round experiments and will use the same CLAS event data as non strange baryon electroproduction studies which are addressed in other portions of the Hall B N^* collaboration proposal.

Due to the average overall acceptance of the CLAS for the three particle final states of approximately 2%, and assuming a luminosity of 10^{34} , one can expect a detectable production rate of about $7 \cdot 10^4$ events/week for the Λ , $5 \cdot 10^4$ events/week for the $\Lambda(1520)$ and 10^4 events/week for the f_0 . Data for both measurements can be accumulated simultaneously.