

# Jefferson Lab

## Proposal Cover Sheet (Generic)

Experimental Hall: \_\_\_\_\_

Days Requested for Approval: \_\_\_\_\_

Submission Date: 5/24/98

Other: PAC 8

☐ New Proposal Title:

☒ Update Experiment Number:

93-028

☐ Letter-of-Intent Title:

(Choose one)

### Proposal Physics Goals

Indicate any experiments that have physics goals similar to those in your proposal.

Approved, Conditionally Approved, and/or Deferred Experiment(s) or proposals:

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Jefferson Lab Use Only

Receipt Date: 5/24/94

PR 94-034

By: \_\_\_\_\_

# UPDATE ON E-93-028

## Deformation of the Nucleon

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May 24, 1994

The quadrupole strength in the  $N - \Delta$  transition is a fundamental quantity for the understanding of the structure of the nucleon and the delta wave function. The experiment E-93-028 has been approved and has received a preliminary rating of B from PAC 5. The apparatus needed and the collaboration is identical to experiment E-93-026 ("Measurement of the Neutron Electric Form Factor") and the experiment E-93-028 should run in sequence with E-93-026 for efficiency.

The present experiment is to measure the asymmetry  $A_{TL}$  in the inclusive  $\vec{H}(\vec{e}, e')$  reaction which is sensitive to contributions from the *longitudinal quadrupole* amplitude. Model dependences are minimized with precise measurements covering a large range of momentum transfer and invariant mass. Longitudinal polarized electrons are scattered from a dynamically polarized proton target oriented such that the polarization axis is perpendicular to the momentum transfer on the  $\Delta$ -resonance. The scattered electron will be detected in the Hall C HMS. The contribution of  $A_{TT}$  off resonance will also be determined via a measurement of  $A_{TT}$  with the proton spin parallel to the beam direction.

As described in the report of E-93-26 the polarized target has been built, and successfully used for the first time during experiment E143 at SLAC. During this experiment the proton polarization of the  $NH_3$ -target has achieved a value of  $\geq 0.9$  which is the assumed polarization in the proposal. The target can operate at beam intensities set out in the proposal assuring that the proposed measurements can be done with the planned uncertainties. The collaboration has also developed a novel polarimeter to measure the polarization of the electron beam.

The collaboration has realized all the elements needed for the successful running of the  $\Delta$ -experiment, and the devices needed for the polarization measurement are calibrated to an accuracy better than needed. We will be ready at the earliest possible time consistent with the availability of polarized beam at CEBAF.