

October 27, 1989

RESEARCH PROPOSAL

A Study of Longitudinal Charged Pion Electroproduction  
in D2, HE3, and HE4

Submitted by

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ABSTRACT

We propose to study longitudinal charged pion electroproduction (in the excitation region below the delta isobar) along the direction of the momentum transfer where the charge scattering process dominates. Direct comparison of the cross section per nucleon in deuterium and the helium isotopes with the experimental value for the free nucleon will provide estimates of the strength of the nuclear pion field. A Rosenbluth separation of the longitudinal and transverse cross sections will be performed for four-momentum transfers of 2.5 and 10 fm<sup>-2</sup>. If current conceptions of pion exchange currents in nuclei are correct, electroproduction will be suppressed at the lower momentum transfer and enhanced at the higher momentum transfer by the nuclear pion excess.