

Proposal to CEBAF -- October 1989

SHADOWING OF REAL PHOTONS IN NUCLEI:  
MEASUREMENT OF THE TOTAL HADRONIC CROSS SECTION

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We propose to measure the energy and A-dependence of the total hadronic cross section for real photons between 0.5 and 3.0 GeV in the CEBAF Large Acceptance Spectrometer (CLAS) by detecting all charged outgoing hadrons produced by tagged photons on nuclear targets (Be, C, O, Al, Cu, Sn, Pb). Measurements on hydrogen and deuterium targets will also be made for calibration. The distribution of neutrons will be sampled with the CLAS trigger counters, and the spectra of  $\pi^0$ s will be measured with thin lead converters inserted between the drift chambers. Corrections for missing solid angle, detection thresholds and neutrals will be made using Monte Carlo calculations constrained by the data. This experiment will fill a major gap in the existing total cross section data, and clarify the transition from isobar production to shadowing and vector meson dominance. Data taken in this experiment will also be extremely useful for checking the calculations of trigger rates and backgrounds for other experiments using the CLAS.