

Abstract

In the one-photon exchange approximation the cross section for the electroproduction reaction $d(e, e'K^+)YN$, where Y is either Λ , Σ^0 or Σ^- and N is a neutron or proton, is a function of four response functions when both target and incident beam are unpolarized. The experiment will do detailed separation of the transverse and longitudinal response functions and ascertain modifications of these response functions for the proton that result from interactions in a nuclear system. The particular virtue of the experiment is that the deuteron is the simplest nucleus in which to study the effects of the Λ -n final state interactions on the separate L and T response functions and modifications to the elementary amplitudes for the isolated proton. Moreover, the experiment shall provide much needed data for the determination of the elementary $n(e, e'K^+)\Sigma^-$ amplitudes for the neutron. These results will form the basis for a systematic study to be extended to heavier nuclei and higher energies. The kinematic range for this experiment will cover the electron squared four-momentum transfer from 0.5 to 2 $(\text{GeV}/c)^2$. The High-Momentum Spectrometer (HMS) and Short-Orbit Spectrometer (SOS) in Hall C will be used to measure the scattered electron and hadron momenta, respectively.