

Abstract

One month of beam time is requested in order to determine the sum of the electric and magnetic polarizabilities of the charged pion by measuring pion photoproduction, $\vec{\gamma}p \rightarrow \gamma\pi^+n$. The experiment will be performed using a liquid hydrogen target in the CLAS at Jefferson Laboratory, and will utilize linearly-polarized 600-1000 MeV photons produced by the Compton back-scattering from the electron beam of laser photons stored in a Fabry-Perot cavity. In addition to high linear polarization, the Compton source promises very high tagging efficiency and a low-background environment, features that, when combined with the comprehensive acceptance and excellent resolution of CLAS, permit the sum of the pion polarizabilities to be extracted with good precision. In particular, the large acceptance of CLAS provides the means to make essential checks on the reliability of the polarizability extraction.