

PR12-21-006: Measurement of the Asymmetry $A_d^{e^+e^-}$ between $e^+ - {}^2H$ and $e^- - {}^2H$ Deep Inelastic Scattering Using SoLID and PEPPo at JLab

K. Orginos, R. Edwards

This proposal aims to measure the electron/positron asymmetry in deep inelastic scattering off a liquid deuterium target in a wide range of (x and Q^2) in order to determine the nucleon $F_3^{\gamma Z}$ structure function. In addition, they propose to extract the electron-quark neutral current effective couplings $2C_{3u} - C_{3d}$. The experiment will take advantage of the SoLID spectrometer in Hall A in the PVDIS configuration and will employ a multi-parameter fitting method to extract the couplings from the data. These measurements appear to be unique and will contribute to the precision tests of the electroweak sector with a potential of improving the constraints for possible beyond the standard model physics. In particular, the extraction of coupling constants will complement the NA004 experiment at CERN is expected to significantly enhance the precision of these quantities. Therefore, the experiment is well motivated and has the potential of obtaining unique and important results.