Abstract Submitted
for the APR21 Meeting of
The American Physical Society

Accessing weak neutral-current coupling C_{3q} using positron and electron beams at Jefferson Lab[1] XIAOCHAO ZHENG, Univ of Virginia, ON BEHALF OF JEFFERSON LAB'S SOLID COLLABORATION — Electroweak neutral-current couplings are important parameters of the Standard Model of particle physics. The product of lepton and quark couplings, C_{1q}, C_{2q} and C_{3q}, or g_{AV}^{eq}, g_{VA}^{eq} and g_{AA}^{eq}, can be accessed in lepton scattering off a nucleon or nuclear target. Recent parity violation electron scattering experiments at Jefferson Lab have improved the precision of the $C_{1q,2q}$ couplings. On the other hand, the C_{3q} couplings can only be measured by comparing scattering cross sections between a lepton and an anti-lepton beam, and have been measured only once at CERN. In this talk, we present the definitions and current knowledge of the $C_{1q,2q,3q}$ and how to access them in charged lepton scattering. We found the DIS cross section asymmetry between an electron and a positron beam scattering off an isoscalar target arise purely from C_{3q}. We present at the end exploratory calculations for possible measurements of C_{3q} using the planned SoLID spectrometer and a positron beam at Jefferson Lab.

[1]This work was supported by the U.S. Department of Energy under Award DE-SC0014434

Xiaochao Zheng
Univ of Virginia

Date submitted: 04 Jan 2021 Electronic form version 1.4