

Abstract Submitted  
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**Parity Violating Deep Inelastic Scattering with SoLID at JLab<sup>1</sup>**

WEIZHI XIONG, Syracuse University, SOLID COLLABORATION — The Solenoidal Large Intensity Device (SoLID) has been proposed at Jefferson Lab. The device will provide a large-acceptance and is designed to handle high-luminosity in order to study parity-violating deep inelastic scattering (PVDIS) as well as the QCD structure of the proton. We plan to measure the parity-violating asymmetry with high statistics and large kinematic coverage ( $0.3 < x < 0.7$ ,  $2 \text{ GeV}^2 < Q^2 < 12 \text{ GeV}^2$ ) using a polarized electron beam. By measuring the PVDIS process from an unpolarized deuterium target, we aim to precisely determine the vector-electron and axial-quark coupling, which provides a unique way to test the Standard Model and search for new physics compared with other parity-violating electron scattering processes. This measurement can also be used to study charge symmetry violation in the PDFs as well as higher-twist effects with quark-quark correlations. In addition, we also plan to measure the asymmetry with a hydrogen target, which allows for an extraction of the  $d/u$  PDF ratio without any nuclear correction. In this talk, we will provide a brief review for these physics topics as well as an overview for the PVDIS experiment using SoLID.

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