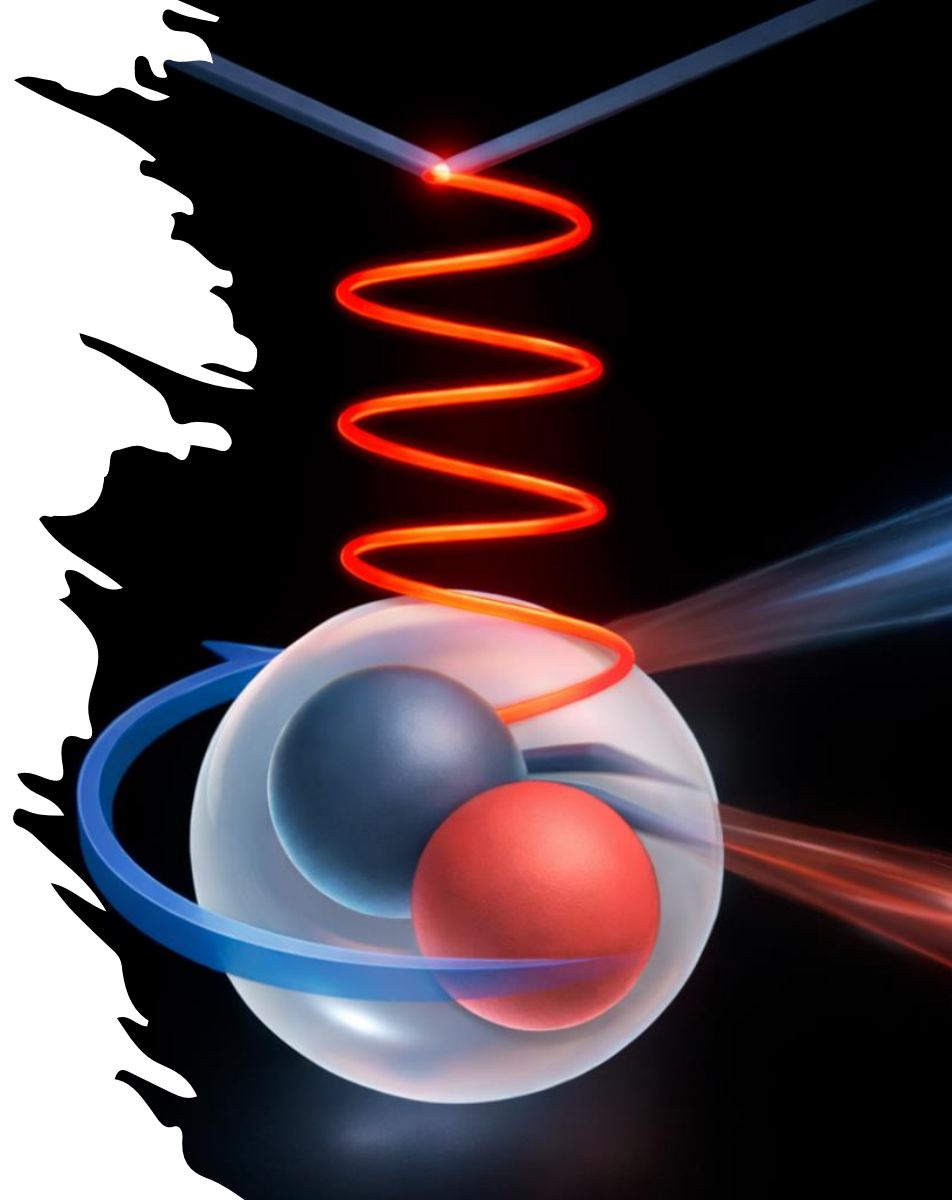
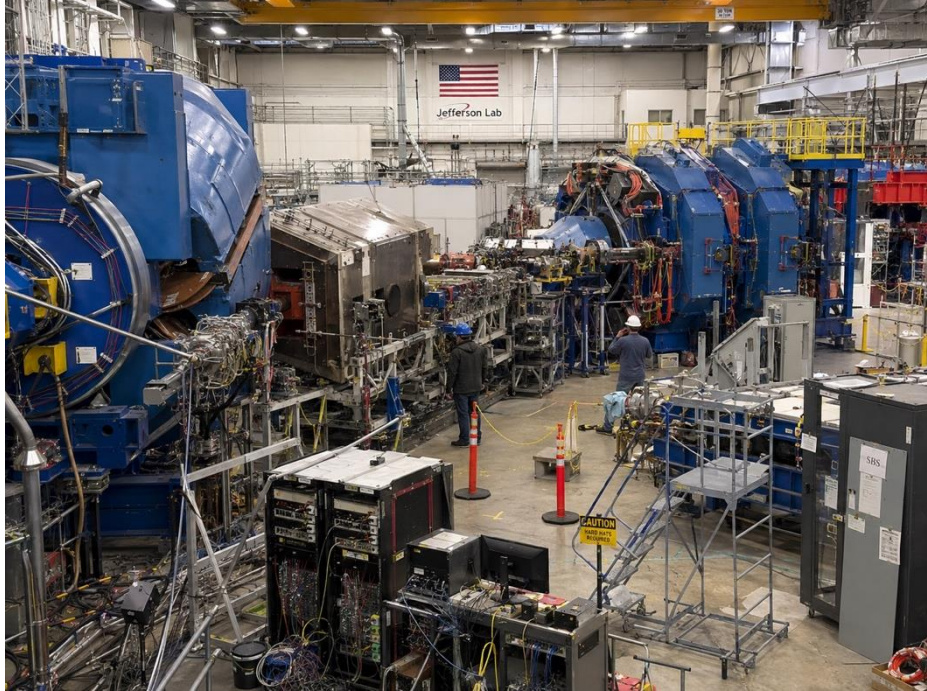


First Tensor SIDIS workshop





The experimental program is underway!

Spin 1 Transverse Momentum Dependent Tensor Structure Functions in CLAS12

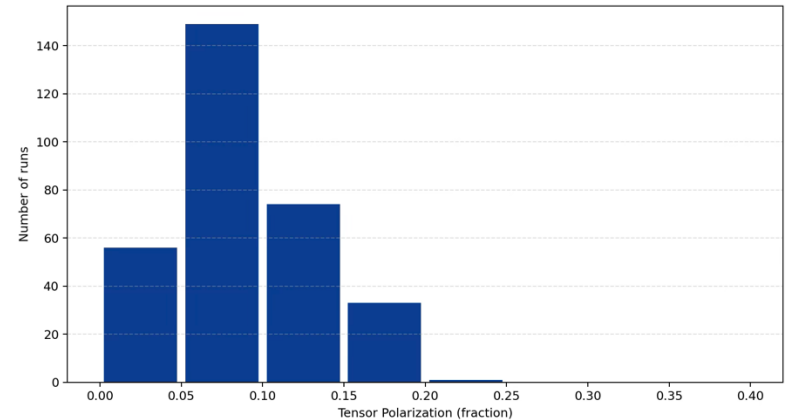
CLAS12 Analysis Proposal

I. P. Fernando, D. Keller
University of Virginia, VA

E. Long, D. Ruth, K. Slifer, S. N. Santiesteban
University of New Hampshire

A. Bacchetta
University of Pavia, IT and INFN Pavia, IT

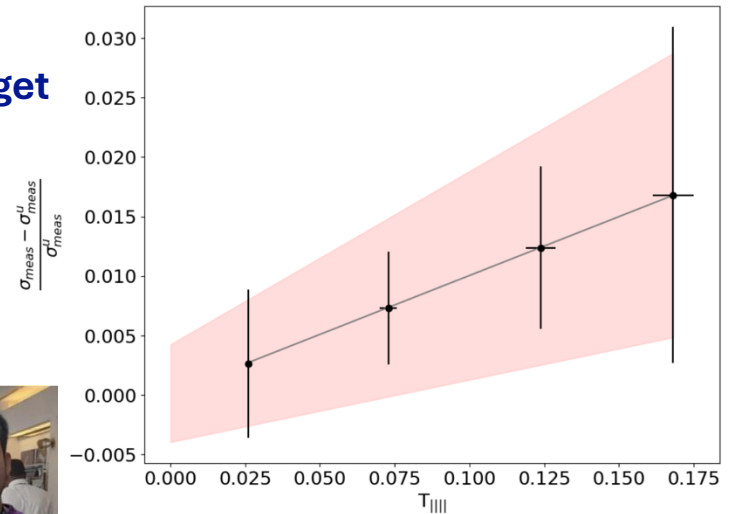
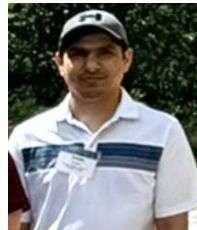
J. P. Chen, J. Poudel[†]
Thomas Jefferson National Accelerator Facility, VA



Longitudinal polarized target

CLAS12 approved analysis (2025)

- RGC data
- Not optimized for tensor measurements
- Exploratory measurement of tensor SIDIS observables



Spin-1 TMDs and Structure Functions of the Deuteron

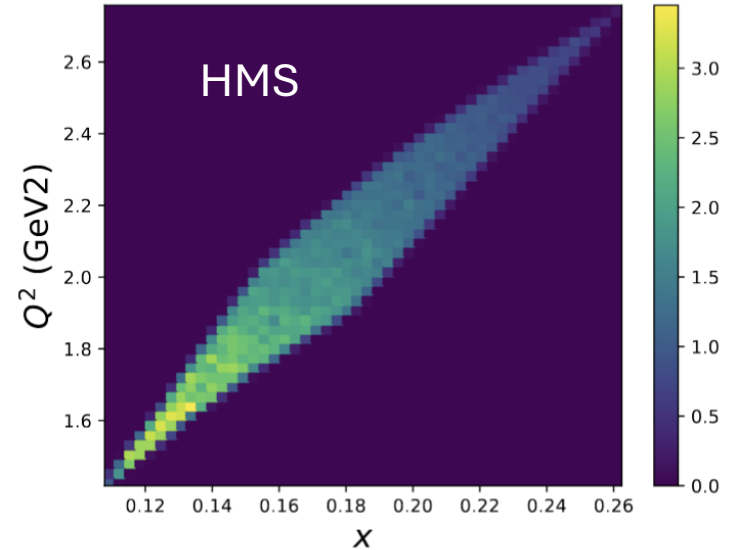
A Letter of Intent to Jefferson Lab PAC 52

E. Long, D. Ruth[†], S. N. Santiesteban, K. Slifer
University of New Hampshire

A. Bacchetta
University of Pavia, IT

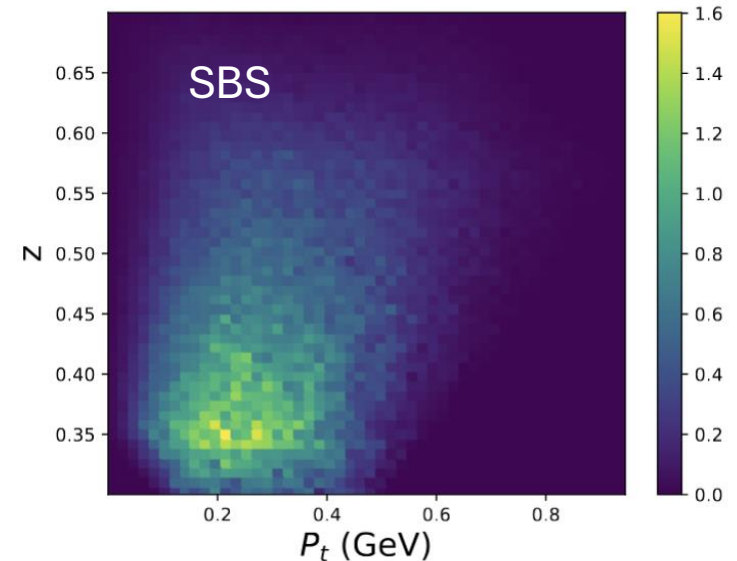
I. P. Fernando, D. Keller
University of Virginia, VA

J. P. Chen, J. Poudel
Thomas Jefferson National Accelerator Facility, VA



LOI PAC 52

- Optimized longitudinal polarized target.
- Hall C: HMS + SBS
- Rates estimated by using 10% of unpolarized cross-section





LOI PAC 54

transversely tensor polarized ND₃ target

A slide from Ishara Fernando and Dustin Keller

- Proposals for JLab

$$F_{U(TT),T}^{\cos(2\phi_h - 2\phi_{LT})} = C \left[-\frac{2(\hat{\mathbf{h}} \cdot \mathbf{p}_T)^2 - \mathbf{p}_T^2}{M^2} f_{1TT} D_1 \right]$$

$$F_{L(TT)}^{\sin(2\phi_h - 2\phi_{TT})} = C \left[-\frac{2(\hat{\mathbf{h}} \cdot \mathbf{p}_T)^2 - \mathbf{p}_T^2}{M^2} g_{1TT} D_1 \right]$$

$$F_{U(TT)}^{\cos(2\phi_{TT})} = C \left[\frac{\mathbf{k}_T \cdot \mathbf{p}_T}{MM_h} h_{1TT} H_1^\perp \right]$$



Why We Need Theory Input for SIDIS Tensor Observables

- The extraction of tensor structure functions in SIDIS requires close coordination between experimental measurements and theory guidance.
- Theory input is essential to define the most meaningful observables, identify the relevant kinematic regions, and connect measured asymmetries to tensor PDFs, TMDs, and structure functions.
- Feedback from the community and collaboration will help establish a clear path toward robust predictions, realistic simulations, and experimentally accessible quantities.



This workshop is an opportunity to build the common framework needed to move from measurements to physics interpretation.