Stony Brook University

Center for Frontiers in Nuclear Science

Studying nucleon/nucleus structure with RHIC, CEBAF, and EIC

Jinlong Zhang
Stony Brook University
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Background: studying sea quark spin at RHIC-STAR

Before joining Stony Brook on 12/01/2017:

- Postdoc, 2016.08 - 2017.11, LBNL

- PhD, 2016.06, Shandong University (China)

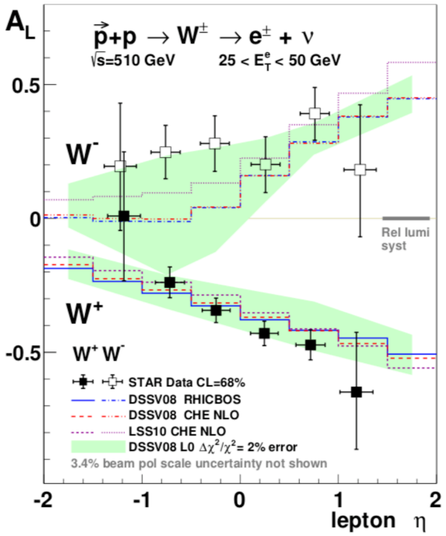
- BSc, 2011.06, Anhui University (China)

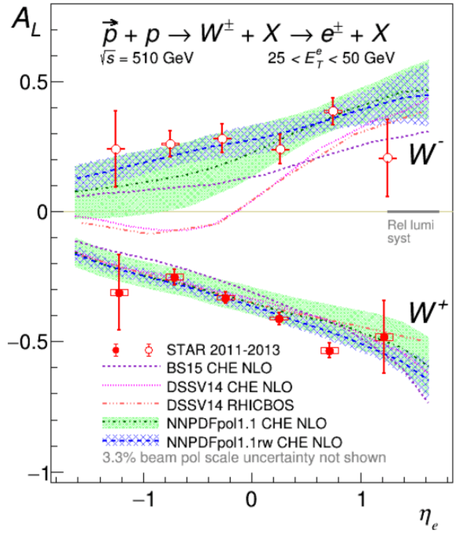
Studying sea quark spin at RHIC-STAR:

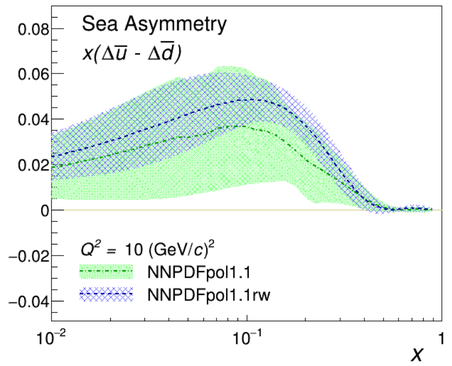
- The W boson A_L results in p+p experiments, indicate the flavor asymmetry between anti-up and anti-down quarks.

- Probe strange quark via hyperon spin transfer measurements.

PRL113 (2014) 072301

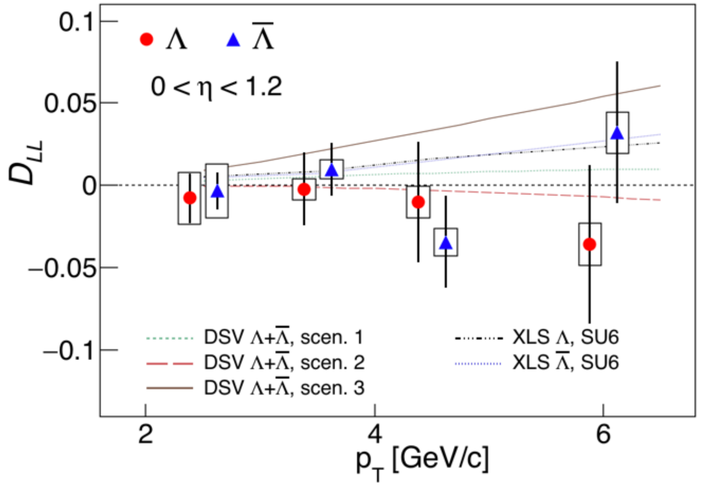






$\Delta\bar{u} > \Delta\bar{d}$!?

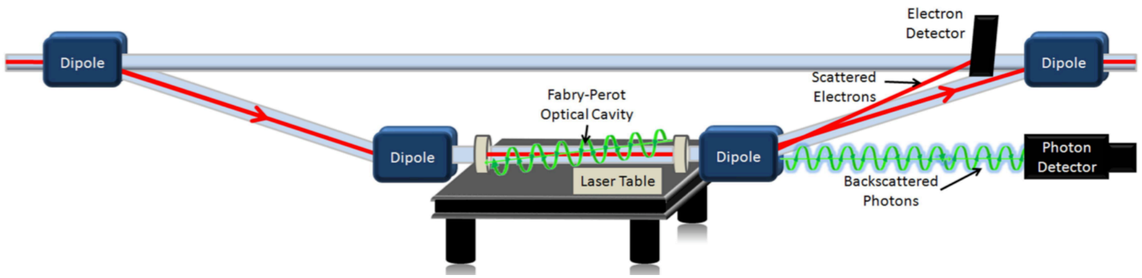
arXiv:1808.07634



Electron polarimetry at Jefferson Lab

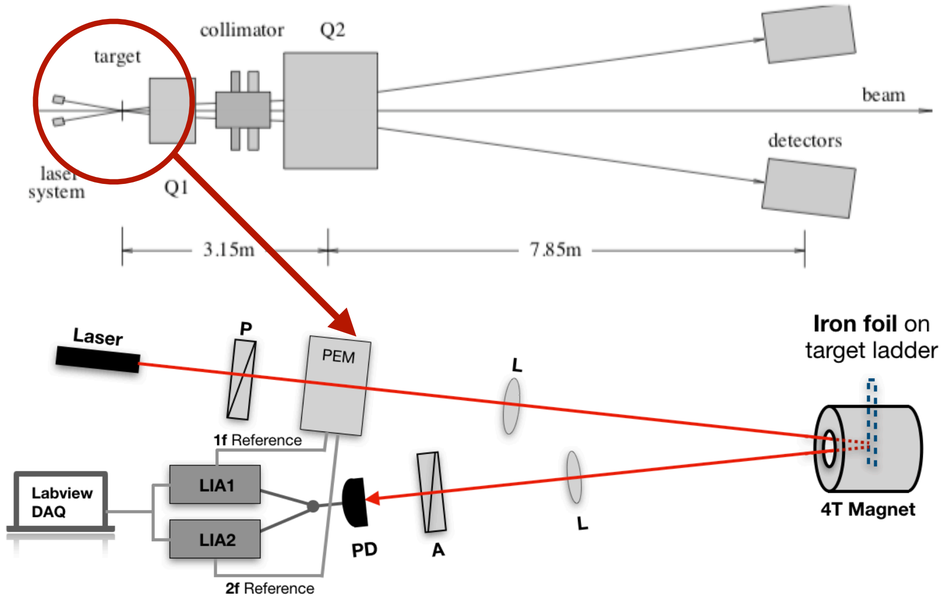
Hall A Compton polarimeter:

- Measure asymmetry of Compton scattering of polarized laser head on the polarized electrons.
- 1% precision required by PREXII/ CREX experiments.
- Focused on DAQ, preparing for PREX-II/CREX run next year.



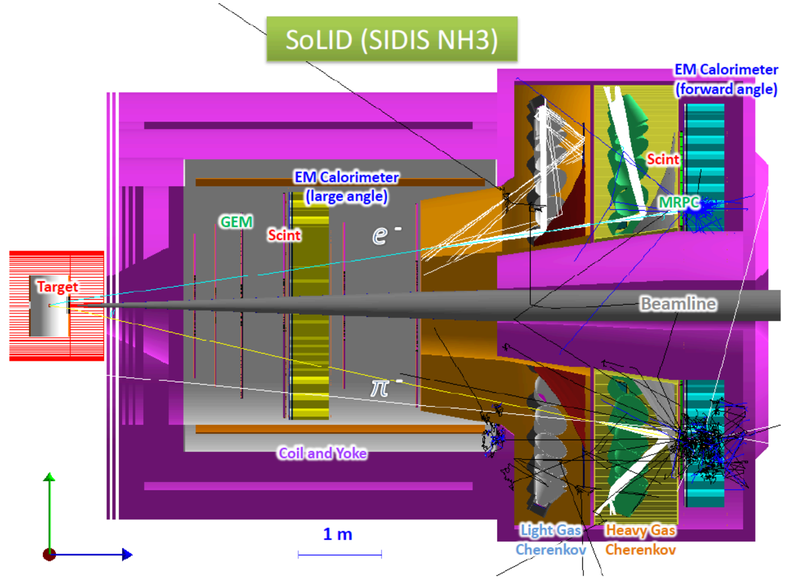
Hall A Moller polarimeter:

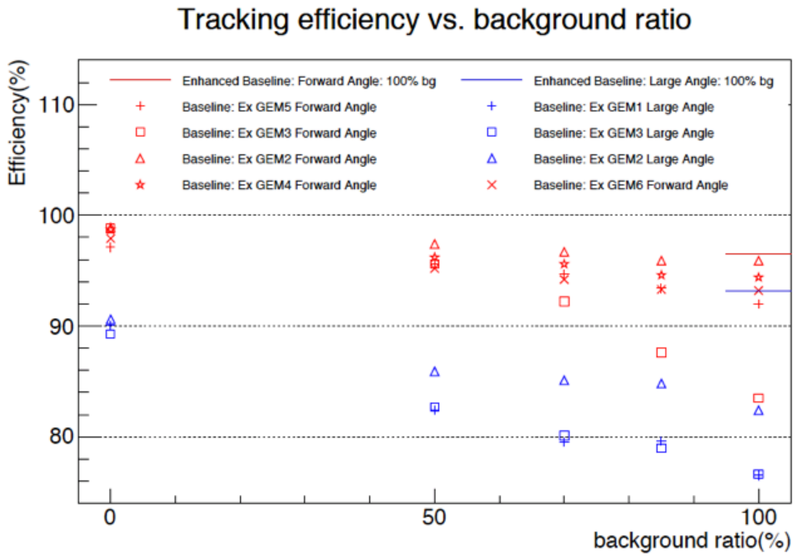
- Higher precision, 0.4%, required by MOLLER experiment.
- Proposed Kerr apparatus (R&D) can help significantly improve precision of target polarization.



Simulation activity for SoLID at Jefferson Lab

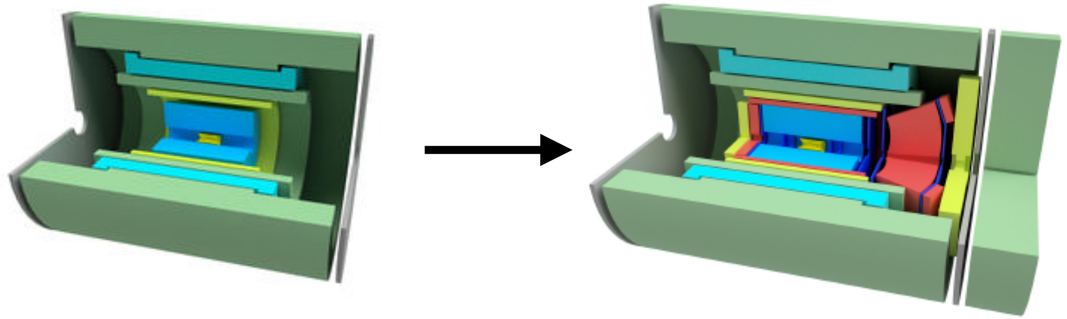
- 12 GeV Hall A experiments with three designed configurations for SIDIS, PVDIS, and J/Psi physics programs.
- Learning and mostly being interested at SIDIS experiments to study the nucleon spin structure.
- Recently got involved with the simulation studies, focused on GEM tracking.



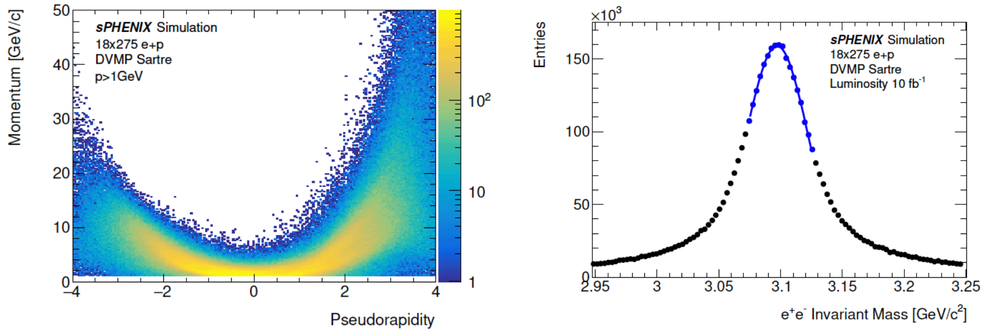


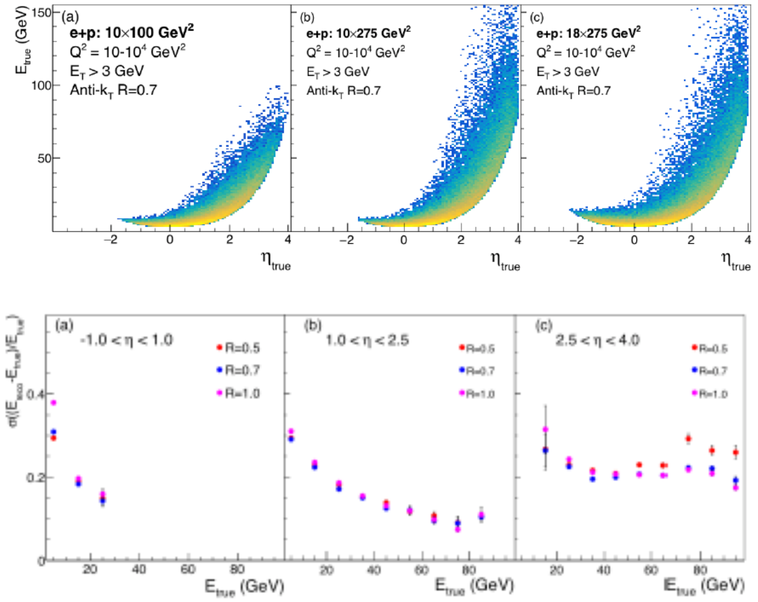
EIC simulation activities at SBU

- EIC detector based on sPHENIX
- Working(ed) with (Dr. Nils Feege) and undergraduate students (Greg Matousek etc).
- Based of sPHENIX full Geant4 simulation framework (thanks to the sPhenix software team).
- Topics: Jet reconstruction, J/Psi production, strangeness production, etc



J/psi production, Sartre + Geant4





Jet production Pythia + Geant4

Planed work on EIC

- Discussing with Dr. Vladimir Khachatryan and BNL experts, planing to systematically simulate exclusive vector meson production, based on Sartre MC generator (**T. Toll, T. Ullrich**), implementing geometrical and saturation scale fluctuations(**H. Mantysaari and B. Schenk** 2016).

- Exploring/learning global analysis tools to assess impacts of pseudo-data.