Double tagging measurements from the A = 3 nuclei in Far Forward region

(Yellow report: section 7.3.8)

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(On the behalf of collaboration)

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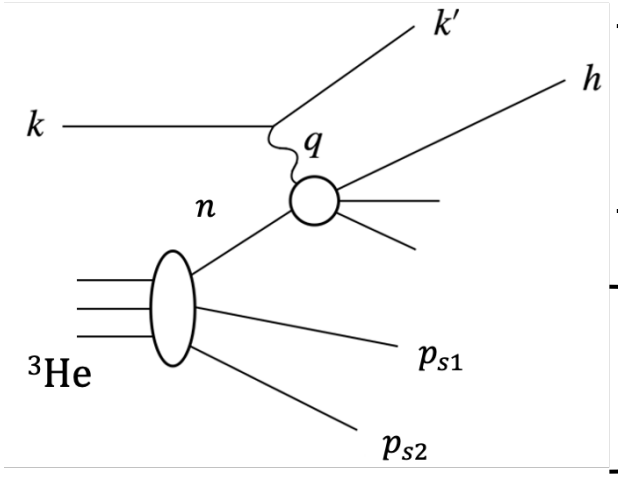
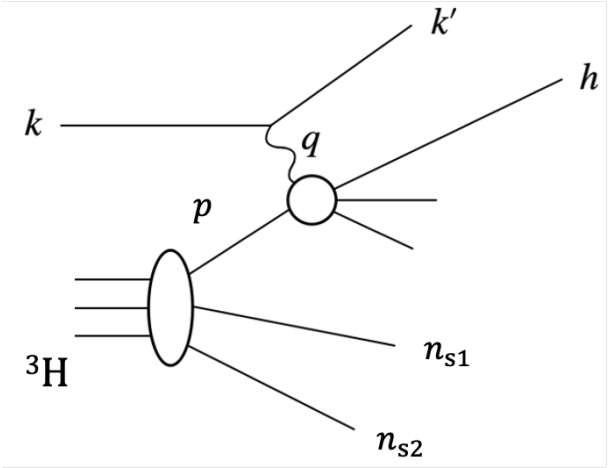
Double tagging measurements from the A = 3 nuclei in Far Forward region



DIS & SIDIS

Tagging



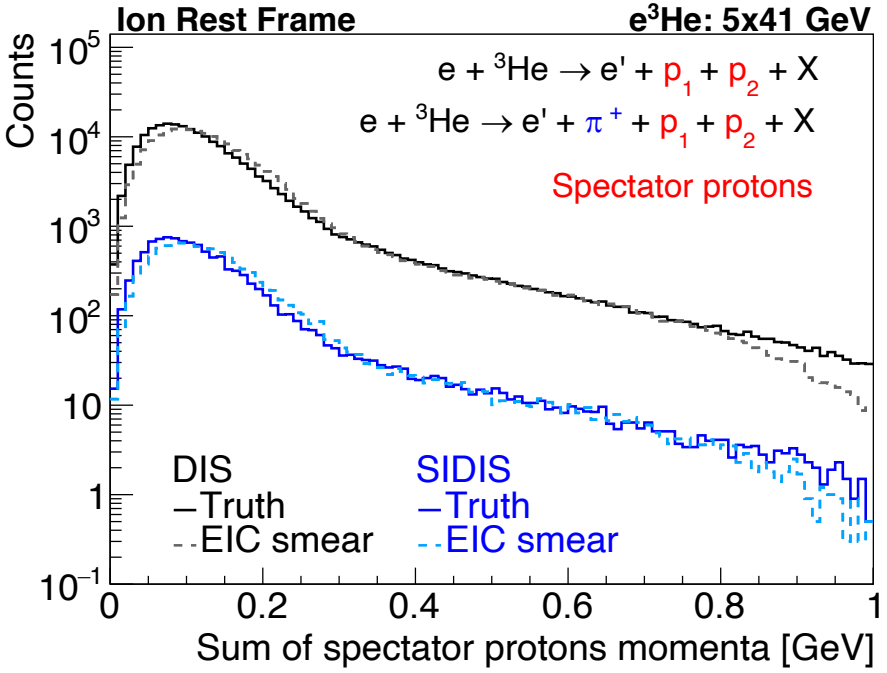
Physics Measurements:

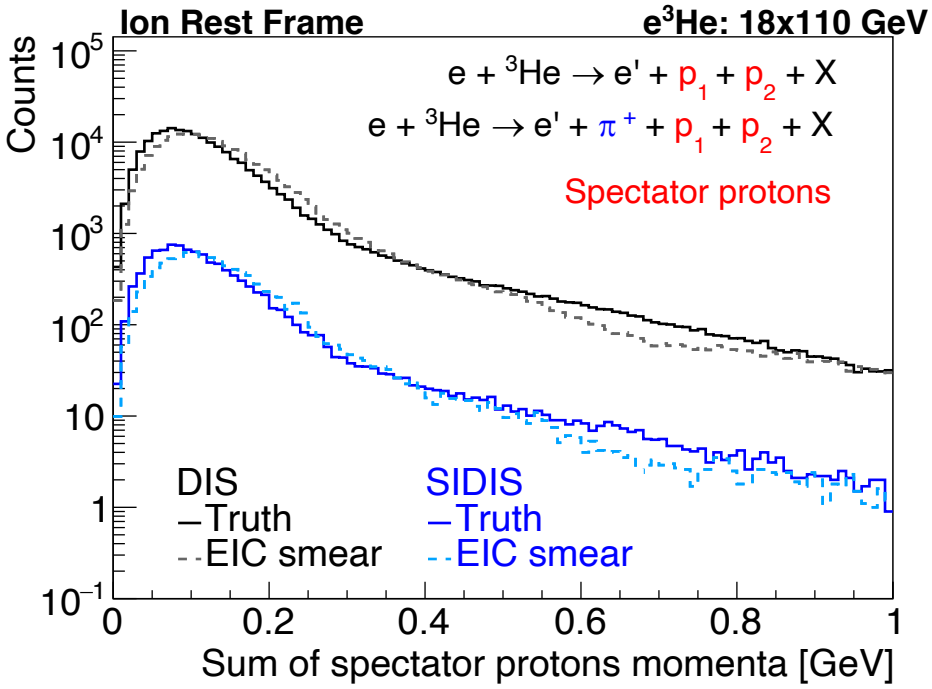
- Both DIS and SIDIS with double tagging ^{3}He(pp, np) and ^{3}H(nn, np)

Physics Goals:

- ❑ Nucleon structure function F_2^n, F_2^p and their modification effects
- ❑ Neutron spin structure study on A_1^n, g_1^n for polarized PDFs
- ❑ TMD measurements: Flavor and spin dependence of the Transverse Momentum Distribution.
- ❑ Constraint QCD theory model prediction for spin distribution.

Effective “free nucleon” target can be obtained from double tagging measurements



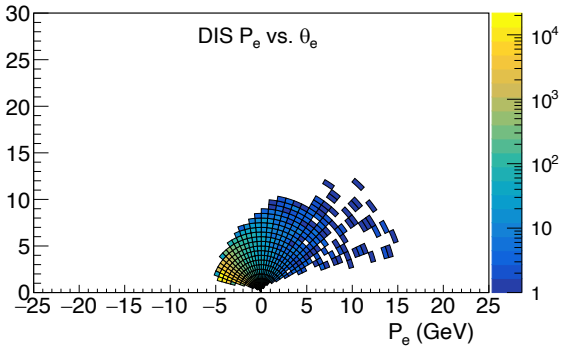


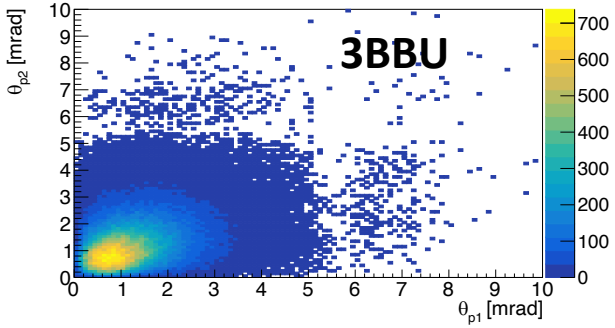
Advantage of the double tagging measurements:

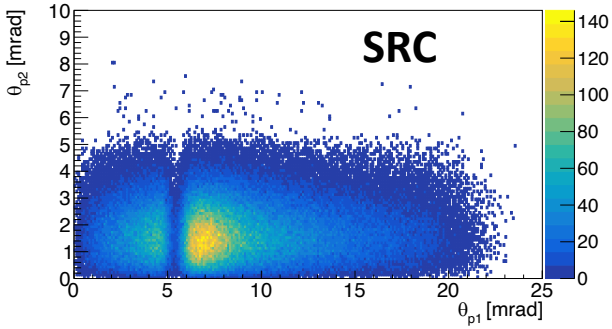
- In Ion Rest Frame (IRF): Constraint the total momentum of two spectator nucleons to low momentum provides almost “Free nucleon” target.
- Minimize the nuclear correction model effects.

Acceptance performance in Far Forward region for double tagging measurements

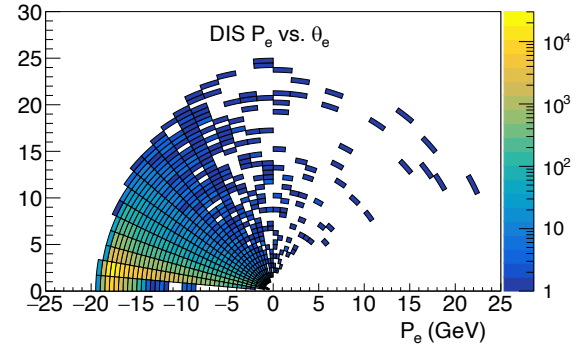
41x5 setting: 3He double tagging protons:

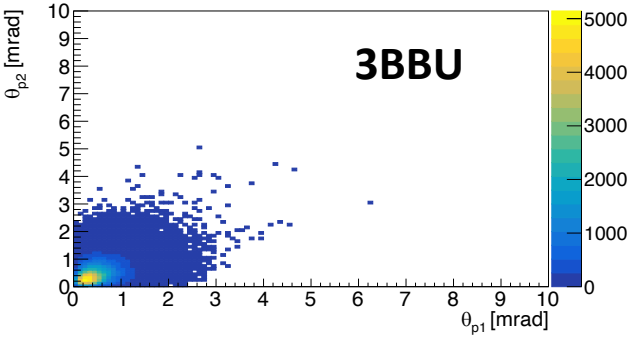


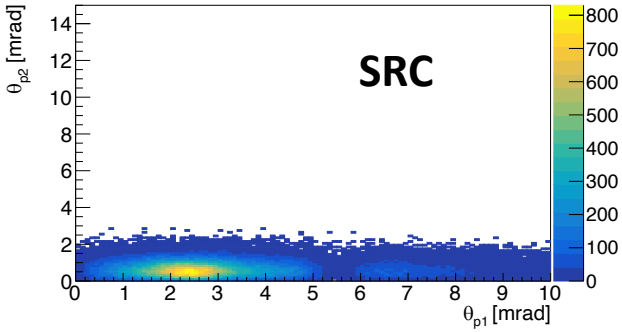




110x18 setting: 3He double tagging protons:







- Far Forward region of the 2nd IR complements that of the 1st
- We are ready to do further simulation study with 2nd IR when it is ready for double tagging measurements