28 January 2025



Outlook

Suggerimento: usa i link per passare a una pagina diversa della presentazione.

Istruzioni: evidenzia il testo, clicca sul simbolo del link sulla barra degli strumenti e seleziona la pagina della presentazione che vuoi collegare.



Introduction



Topics of interest



Presentation of the groups



Time for discussion



WHY SIDIS?

We are already involved in the dRICH project: SIDIS process of interest for evaluating dRich design performances

Close collaboration with Theory groups in Pavia and Torino working on TMDs

Experience and interest in nucleon structure studies

Torna all'Indice

Experience in Spin Physics and Nucleon Structure gained at CLAS at JLAB and **COMPASS at CERN**

Pavia: unpolarized and polarized TMDs Collaboration with Theory groups for impact studies Torino: polarized TMDs fragmentation function elementary cross-section final detected hadron Incoming proton function Example: Study of relevant kynematic distributions,

Sinergy with dRICH project

acceptance studies, PID





Proposal for EIC Science Program in the First Years

Year - 1

Start with Phase 1 EIC New Capability:
Commission electron

polarization in parallel

10 GeV electrons on 115 GeV/u heavy ion beams (Ru or Cu)

Physics:

Add your preferred science topic

Year - 2

Phase 1 EIC

+ electron polarization

New Capability:

Commission proton polarization in parallel

10 GeV polarized electrons on 130 GeV/u Deuterium

Add your preferred science topic

Run:

Last weeks 10 GeV electrons and 130 GeV polarized protons Physics:

Add your preferred science topic

Year - 3

Phase 1 EIC

- + electron polarization
- proton polarization

New Capability:

Commission running with hadron spin rotators

Run:

10 GeV polarized electrons on 130 GeV transverse polarized protons

Physics:

Add your preferred science topic

Run:

Last weeks switch to longitudinal proton polarization

Physics:

Add your preferred science topic

Year - 4

Phase 1 EIC

- + electron polarization
- + proton polarization
- + operation of hadron spin rotators

Commission hadron accelerator to operate with not centered orbits

10 GeV polarized electrons on 100 GeV Au

Physics:

Add your preferred science topic

Run:

10 GeV electrons on 250 GeV transverse and longitudinal polarized protons

Physics

Add your preferred science topic

Year - 5

Phase 1 EIC

- + electron polarization
- + proton polarization
- + operation of hadron spin rotators
- + operation of hadron beams with not

centered orbits

10 GeV polarized electrons on 100 GeV Au

Physics:

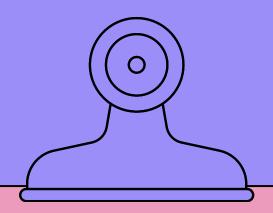
Add your preferred science topic

Run:

10 GeV electrons on 166 GeV transverse and longitudinal polarized He-3

Physics

Add your preferred science topic



Early science program

from the slides of Elke at the ePIC Collaboration Meeting in Frascati last week



Topics of interest

Torna all'Indice

Fai clic con il tasto destro sullo sfondo della diapositiva, o sull'anteprima sotto, per espandere questa pagina in una lavagna e ottenere più spazio.

1

Unpolarized TMDs (e+p/D) with identified pions/kaons

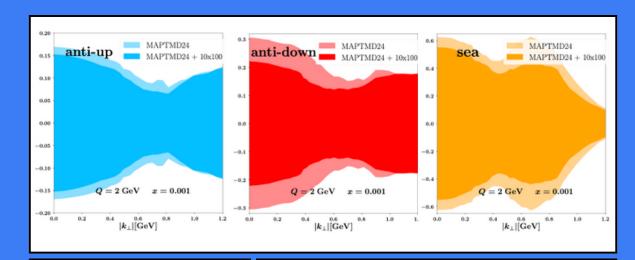
Impact studies already ongoing on unpolarized TMDs (e+p) with identified pions, by Pavia group using pseudo-data provided by Gregory Matousek (Duke)

2

Sivers (e+p/D) with identified pions/kaons

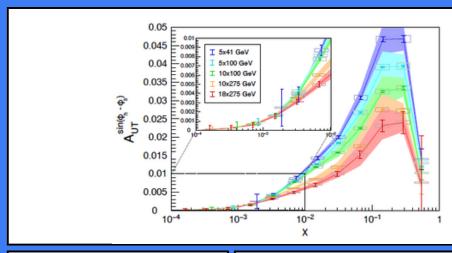
Impact studies started on Sivers (e+p) with identified pions, by Torino group using pseudo-data provided by Gregory Matousek (Duke)

tudies of relevant kynematic distributions, reconstruction efficiency, PID, radiative corrections

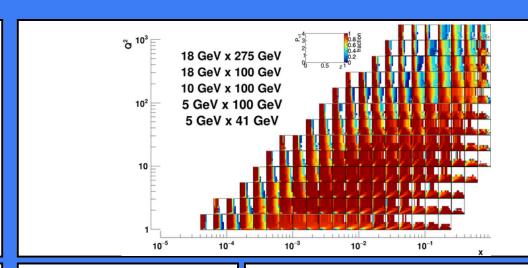


Results by L. Rossi

MAPTMD24 2031 EIC # pts. lumi [fb-1] 10x100 1611 5



Athena Detector Proposal Projected Sivers asymmetries extracted from ATHENA pseudodata compared to projections from the Pavia extraction for charged pions.



Yellow Report

PID acceptance fractions as a function of pion fractional energy z and transverse momentum PhT in bins of x and Q2.





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Ferrara

Marco Contalbrigo, Staff Researcher

Lorenzo Polizzi, PhD

Interest: mainly topic 3, synergy with dRICH studies

Pavia

Gianluigi Boca, Staff Researcher

Susanna Costanza, Associate Professor

Nicolò Valle, Postdoc

Interest: mainly topic 1

Theory group: Filippo Delcarro (Postdoc), Marco Radici (Staff Researcher)

Torino

Michela Chiosso, Associate Professor

Davide Giordano, Post Doc

Interest: mainly topic 2, 3

Theory group: Mariaelena Boglione (Full Professor), Emanuele Nocera (Associate Professor), Andrea Signori (Associate Professor)

Salerno

Annalisa De Caro, Associate Professor

Cristina Ripoli, Postdoc

Interest:mainly topic 1

Laboratori Nazionali del Sud

Dario Lattuada, Tenure Track Researcher

one Postdoc

Interest:

Trieste

Andrea Bressan, Associate Professor

Interest: mainly topic 1*, 2, 3
*also with unidentified hadrons

First steps

Become familiar with ePIC simulation and reconstruction software



Time for discussion

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One additional information: we have an internal INFN milestone for September 2025 on "Performance studies of PID detectors in the extraction of TMDs" Are there other groups, except Duke, already involved in these tasks? Which kind of deliverables? Is there a list of priorities?

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