

SIDIS status for ESR NIM article

PAC meeting

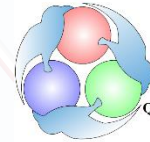
June 30, 2026

Anselm Vossen (Duke)

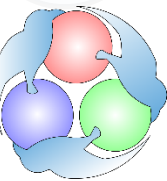
Ralf Seidl (U Tokyo, QNSI)



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東京大学理学系研究科附属
クォーク・核物理研究機構



Analysis

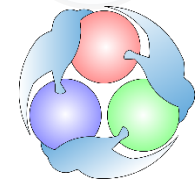
- Most analysis topics are already well established for the early science NIM papers, but
- Several need to still write Analysis notes and present at a Physics forum:
 - Unpol TMDs
 - Helicities
 - nFFs
 - Di-hadron for low x (needs to start using also campaign data)
- Possible more additions:
 - Di-hadron for gluon Sivers (Javier/Charlotte)
 - Sivers lepton-Jet and hadron-in-jet Collins asymmetries
- Nearly all still need new data sets from July campaigns:
 - 9x130 and 9x275 e+p DIS simulations
 - 9x166 e+He3 simulations with parton info
 - 9x 100/115 e+Au/e+Ag simulations e+p

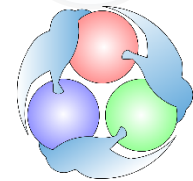
Simulations for July Campaign

- June Pythia8 9x130/275 simulations only contain 1-10,10-100 and 100-1000 Q2 bins
- I created the usual 9x130/275 Pythia6 simulations, not sure if they are used
- Not sure about status for BeAGLE samples

General aspects of ESR

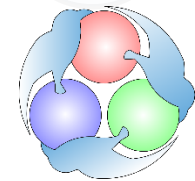
- We will start working on the ESR NIM SIDIS standalone text, keeping in mind the comments we received to the ESR appendix by the reviewers and the discussions at the early science workshop, mainly:
 - Add table of planned measurements to each section
 - Discuss the state-of-the-art/expected knowledge at the time of the early science report
 - Balance the different sections better in terms of discussions and wording





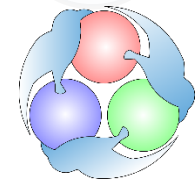
Roadmap for early science impact studies +NIMA

- nFF (+nPDF):
 - Charlotte and Pia are working on it,
 - Need the updated simulations
 - impact studies all well prepared (though precision compared to existing data too good – no replicas survive...)
 - Probably can expect new impact plots made public in physics forum
- Low-x studies:
 - Gabriel Garcia
 - will see if the study can be repeated on the simulation campaign, if so will require to make new plots public



Roadmap continued

- Unpolarized TMDs:
 - ES Data will be updated by Lorenzo Polizzi and Sara Pucillo
 - Updated impact figures by Pavia group essentially ready, need the new ES data
 - Working on AN (once new data is available)
 - Will make new figures public in physics forum
- Sivers/Collins Asymmetries:
 - framework established
 - Alexey Vladimirov(Sivers) and Daniel Pitonyak/JAM (Transversity+Collins) to able to produce updated ES impact figures
 - Some attempts to get polarized structure functions+uncertainties from phenomenologists to show impact already on asymmetry level
 - Update to include reconstructed spectator proton tagging



Roadmap continued

- A_{1p}
 - Charlotte has framework ready, work on data as it becomes available
 - Getting impact plots from phenomenologists might be difficult as main person currently on paternity leave –maybe possibility to show uncertainties on the expected asymmetries instead?
 - Will need new plots to be made public
- A_{1n} /spectator tagging:
 - So far no active work on tagging in our group, maybe concentrate on impact of $A_{1D/3He}$ in studies above?

Roadmap continued

- Gluon Sivers?
 - Currently not in ESR but could be very useful, Charlotte's student Javier Jimenez-Lopez is working di-hadron case, little progress on D meson case by Artur
 - Still waiting for updates due to classes
 - Would need to make figures public