

03/28/2019

Thursday, March-29 7 pm meeting summary:

Main agenda:

1. Sivers asymmetry extraction from MC events. Goal: Understand all step in the Sivers asymmetry extraction.
2. List the critical issues in the analysis and assign the PIC (person in charge) for each issue.

Slide: <https://seaquest-docdb.fnal.gov/cgi-bin/private/ShowDocument?docid=5362>

Some of main discussions:

Issue 1: phi-s definition, reference frame and future improvement

There was a confusion about the best reference frame for Drell-Yan. I followed the E1039-Proposal which used the Collin-Sopper frame, but the definition of phi-s (the spin polarization vector angle) is not clear. Is Collin-sopper frame the best reference for Drell-Yan analysis? I quoted some reference in my slide. The NMSU group have also discussed this issue but the conclusion hasn't settled yet. In the meeting, we got two others good paper/literature for reference:

<https://link.springer.com/article/10.1140/epjc/s10052-014-2769-7>

http://wwwcompass.cern.ch/compass/notes_public/2010-2.pdf

There was also offline discussion with Kenichi about the paper Phys. Rev. D 79, 034005 (2009) by S. Arnold et al "Dilepton production from polarized hadron hadron collisions". The (preliminary) conclusion is the dilepton rest frame (Collins-Sopper frame) is the frame that we have to use.

There was also suggestion to put the phi-asymmetry correction to the Sivers extraction.

Issue 2: Is rate dependence affect asymmetry

The incoming proton beam intensity are not flat. Is the rate dependence affect the asymmetry? It is too early to put a conclusion but everybody agree that this issue worth to be investigated.

Issue 3: List and Assign

Part 2 of the meeting listed the critical issue needed to be addressed and assign (proposed) the PIC (Person in Charge). The issues are listed on the slide. Here are some of the assignment:

Issue: Sivers Asymmetry framework

Description: Setup a framework/macro to extract Sivers Asymmetry from a Full simulation

PIC: Zulkaida & Forhad

Issue: E906-E1039 Bridge

Description: Provide information or general framework or dictionary for new comers to learn E906 data

PIC: Kenichi

Issue: Detector performance

Description: Establish methods to measure the detector performance & calibration

PIC: Mindy (for Chamber)

Issue: Trigger performance

Description: Establish methods to measure the trigger efficiency

PIC: Michigan grup for FPGA trigger (proposed in the meeting, I will email them soon), Forhad

Issue: Systematics

Description: Perform a packing factor measurement, Establish the best method to measure the dilution factor, Keeping track for all non-negligible systematic source that affect the Sivers asymmetry

PIC: Arthur, David UNH (proposed)

Issue: Background studies

Description: Establish the best method to find the line shape & simulate the random background, Establish the best method to separate events from beam dump

PIC: Zulkaida

Issue: Tracking

Description: Establish an efficient tracking algorithm

PIC: Haiwang

Issue 4: Questions from Rick

Rick could not attend the Thursday meeting. But he sent me an email about some point needed to be discussed in the meeting:

1. Instructions for getting started in analysis (for people new to this experiment and our software eg: me)? [That's my job \(Zulkaida\). Give me a week to provide these instructions](#)
2. Can we reconstruct MC events using existing reconstruction code? [Yes](#)
3. What is the strategy for production reconstruction? [We are working on it](#)
4. We will need to plan a "Mock Data Challenge" for this spring? [Unfortunately, this point haven't been discussed thoroughly yet in the meeting](#)
5. Determine what is needed for calibrating of the detector? [We are starting to assign people to address this issue for each sub-system](#)
 - o Plateau/Efficiency of chambers/hodoscopes (software, computing resources)
 - o Alignment of chambers/hodoscopes (software, computing resources)

Issue 5: Priority

The next priority will be the E906-E1039 Bridge. Thanks to Kenichi who will provide us with some lectures so the "new comers" including me could learn about the E906 experience, have an insight about the nature of the data & data processing, etc.