

Mott PSTP Presentation Outline

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1 Background and Motivation

GENERAL NOTES: Talk is expected to be 25+5 minute format. Informal workshop atmosphere. Expert Audience. Not a 1-to-1 correspondance between subsections and slides.

Goal of 3-4 slides to discuss the status before upgrades began and light theory.

1.1 CEBAF Mott Polarimeter

- Schematic of chamber.
- Discussion of foils.
- Talk about beam parameters.

1.2 Analyzing Power

- Effective sherman function for thick targets.
- Ad Hoc Extrapolation to match theory.

1.3 Previous Work

- Michael's Spin 2000 paper.
- Verified with GEANT3.
- Little documentation.

1.4 Goals

- Commision new "Parity" DAQ for high rep rate.
- Reduce Background rates through hardware and software updates.
- Implement GEANT4 model for 1) Realistic Detector Response 2) Better Handling of Effective Sherman Function.

2 New DAQ

Idea is to talk about the usefulness of new DAQ features. Input from Riad is useful. Ideally 1-2 slides. Possibly merged into another section.

2.1 DAQ Features

- Can take helicity-correlated beam parameters.
- New TDC Data.

3 Background Reduction

Goal 2-3 slides on hardware upgrades and software analysis tasks to improve handling of Dump Events. Input from Joe and Charlie about new dump plate is good.

3.1 New Dump Plate

- GEANT4 optimization of new plate with Be and Cu.
- Reduction by factor of 2, 5 , 10?

3.2 Software Handling

- Software gain matching.
- Background subtraction using TDC cuts.

4 Energy Spectra and GEANT4 Modeling

Goal of 10-ish slides. Largely my work. Overarching Goals 1) reproduce detector response to electrons fired directly to detectors 2) Reproduce Elastically scattered spectra 3) Get Realistic Physics Asymmetries.

4.1 Discussion of our Spectra

- Talk about shape of background-subtracted and raw spectra (Long Tail).
- Talk about asymmetry vs. energy spectra as useful in determining backgrounds.

4.2 Realistic Detector Response

- Slides similar to those shown today.
- Broadening of spectra and sources (collimator scraping, window, air, dE, etc.).
- Photon collection.

4.3 Spin Physics & Mott Asymmetries

- Talk about theoretical interest.
- Radiative losses in target as possible source of long tail.
- Progress and Future work on including/upgrading into GEANT4.

5 Conclusion

Discuss Fall Run Plans. Any extra slides you think might be interesting please let me know.