Update on Beam Polarization Measurements

Aidan Kelleher

August 12, 2009

1 The Problem

- Have Compton data for Kin 2 and Kin 3
- No overlapping Compton/Møller Data
- No final Møller results

2 Mott Polarization

Only 2 Mott polarization measurements were made during E02-013. They roughly agree with the Compton Polarization results.

Date	Compton	Mott 1	Mott 2
Mar 30, 2006	84.26 ± 1.39	83.32 ± 1.19	81.62 ± 1.45
Apr 13, 2006	84.60 ± 2.20	84.12 ± 1.11	83.25 ± 1.11

3 Compton Polarization

Some Compton data were taken during Kin 1 and Kin 4. No absolute polarization information can be recovered. However, investigating possibility of using asymmetry as a running relative measurement. The data quality is not good and we will be using the raw counts.

An plot depicting data quality for Kin 1 is included as Fig. 1



Figure 1: Compton Data for Kin 1. The plot is the asymmetry seen in the compton for run 13013, taken Mar 5, 2006

4 Møller Polarization

As of this meeting, I do not have final Møller numbers. The website lists preliminary numbers, and E. Chudakov gave me final number for some, but not all of the Møller measurements. After a conversation with O. Glamazdin, he will send me a summary of final results, and I will post that to the wiki.

Date	Web (prelim)	Email (final)
Feb 28, 2006	87.75 ± 0.15	88.8 ± 0.2
March 4, 2006	87.78 ± 0.23	88.2 ± 0.2
March 10, 2006	84.14 ± 0.08	86.0 ± 0.2
March 25, 2006	81.29 ± 0.09	82.2 ± 0.2
May 10, 2006	84.88 ± 0.07	$??^{1}$
May 12, 2006	84.35 ± 0.20^2	n/a

The email quotes a systematic error of 3%, the website quotes a preliminary systematic error of 2%.

5 Moving Forward

For the kinematics with Compton data, I recommend that we use the Compton numbers provided. For the remaining kinematics, we must use the Møller numbers. I suspect the raw Compton asymmetries to be of limited value, but they may be used to look for large shifts in the beam polarization.