Update on Beam Polarization Measurements v. 0.2

Aidan Kelleher

August 19, 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 3 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
Apr 19, 2006	81.20 ± 1.30	83.18 ± 1.28	82.82 ± 2.81

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. A first look at these asymmetries shows the poor quality of the data. There are very few runs for kin 1 (Fig.



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

- 2) and the asymmetries move around too much to be useful for kin. 4 (Fig.
- 3). A plot depicting data quality for Kin 1 is included as Fig. 1

I suggest that we use Møller data only for kinematic points 1 and 4.

4 Møller Polarization

Final Møller numbers have been provided by O. Glamazdin and E. Chudakov.

Date	Møller
Feb 28, 2006	-88.43 ± 0.08
March 4, 2006	87.81 ± 0.10
March 10, 2006	-85.05 ± 0.08
March 25, 2006	-81.65 ± 0.09
May 10, 2006	-85.27 ± 0.06
May 12, 2006	84.77 ± 0.20

There is a 2% systematic error for these results.



Figure 2: Compton Asymmetries for Kin 1. Plot of the raw asymmetries for compton runs during Kin 1, background has not been subtracted.

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. The raw Compton asymmetries appear to be of limited value.

I will confer with S. Riordan to load the polarization measurements into the database – Compton where available and Møller otherwise.



Figure 3: Compton Asymmetries for Kin 4. Plot of the raw asymmetries for compton runs during Kin 4, background has not been subtracted.