

Møller Polarimeter Status

E.Chudakov¹ for Hall A Møller group

¹Hall A, JLab

For Hall A collaboration meeting, Dec 2005

Outline

- 1 2005 Upgrade
- 2 Measurements
- 3 Outlook

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Improving Systematic Error

Systematic error

Variable	Error	
	OLD	NEW
Target polarization	3.5%	2.0%
Target angle	0.5%	0.5%
Analyzing power	0.3%	0.3%
Levchuk effect	0.2%	0.2%
Dead time	0.3%	0.3%
Total	3.6%	2.1%

Target Upgrade

Old

- Place for 2 target foils $\sim 3 \times 2 \text{ cm}^2$
- Mostly used $12 \mu\text{m}$ supermendur
- $20\text{-}160^\circ$ in horizontal plane ($\mathcal{P}_X^{\text{beam}} \cdot \mathcal{P}_X^{\text{targ}}$ -coupling)
- One point on the foil irradiated
- **Magnetic flux variation across the foil** - how to treat?

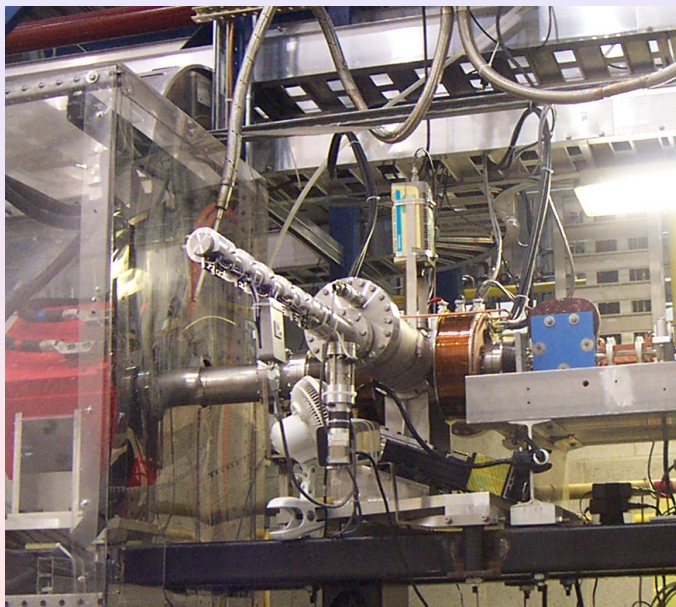
New

- 5 target foils $\sim 15 \times 3 \text{ cm}^2$
- Supermendur and iron $7\text{-}30 \mu\text{m}$
- 20° in vertical plane
- Scanning across the foil surface

Foils Mounting



Target Mounting

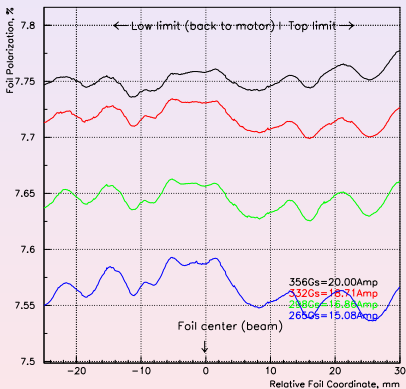
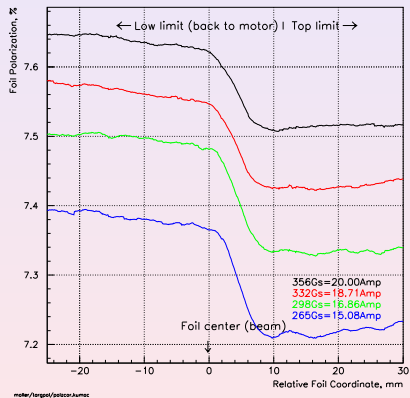


Target Foils

Foils Properties

Foil	0	1	2	3	4	5
Material	Al	SM	SM	Fe	Fe	SM
Thickness μm	16.5	13.0	29.4	14.3	9.3	6.8
Origin	-	old	SLAC	Kh	Kh	Kh
P_{center} % prelim	-	7.95	8.20	7.62	7.42	7.97

Target Foils

3_fe14 14.3 μm 4_fe10 9.3 μm 

Measurements

Measurements

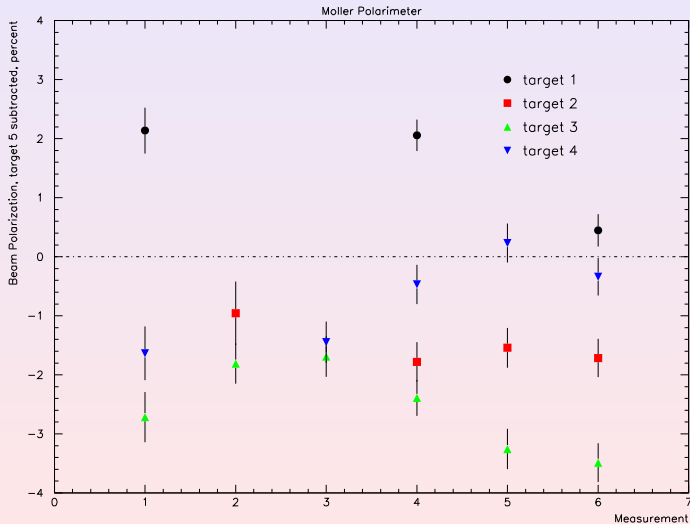
- 7 measurements in August - October
- Scans across the foils
- Dependence on the magnetic field
- Other systematic studies

Data analysis - what has not been done yet

- Scans analysis
- Magnetic field dependence
- Re-calculating the target polarization

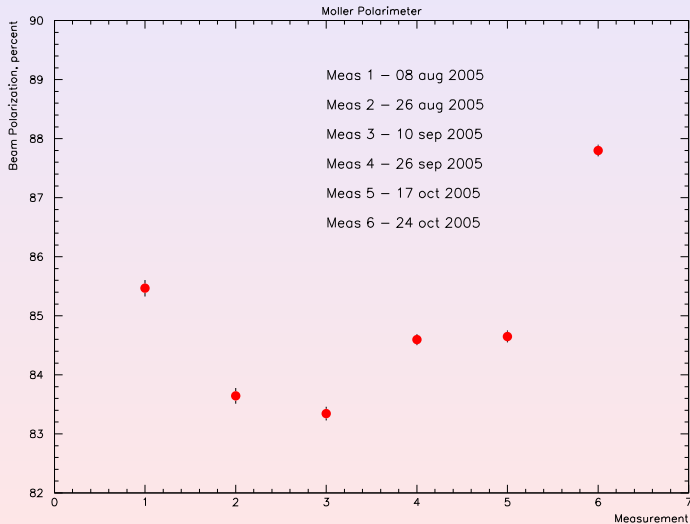
Preliminary results

2005/12/04 20.28



Preliminary results

2005/12/04 21.25



Outlook

Plans for December - February

- Analyze the scan data and data at various fields
- Correct the target polarizations
- Work on a NIM paper