

# Introduction: Polarisation at HERA

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POL2000 (= HERMES + H1 + Zeus + HERA machine)

- Status of POL analysis as of summer 2007
- Plans for the future

A reminder:

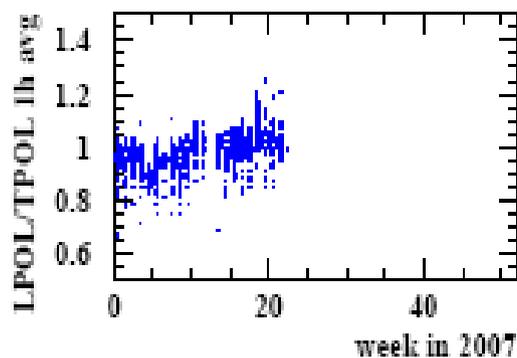
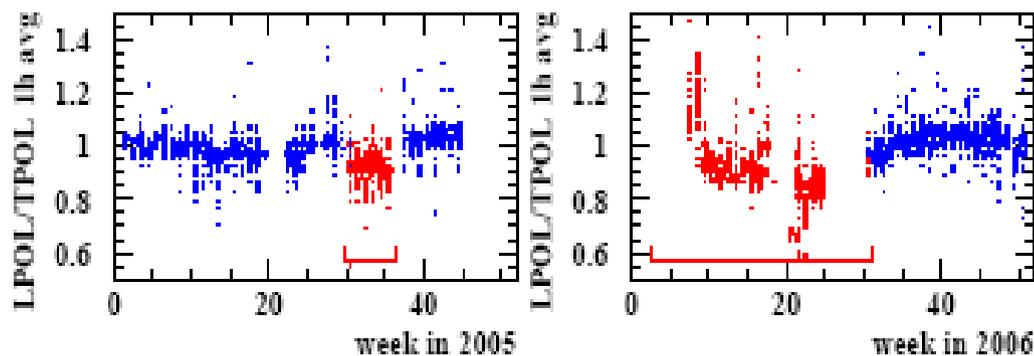
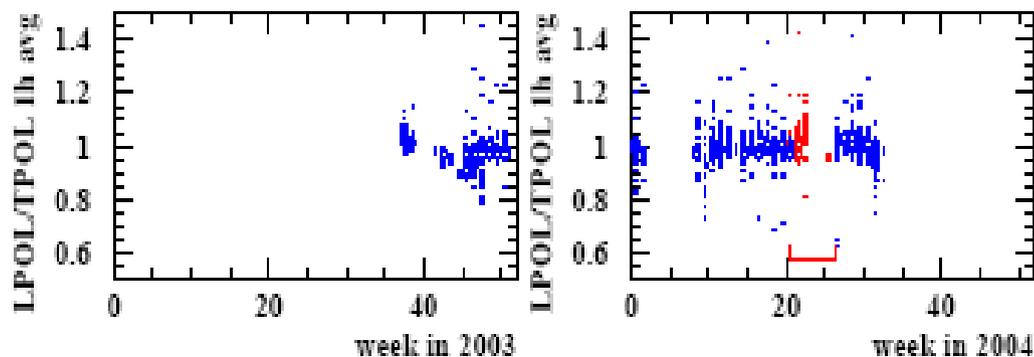
the current POL analysis is basically an online analysis

not all corrections are applied, no final data selection is done

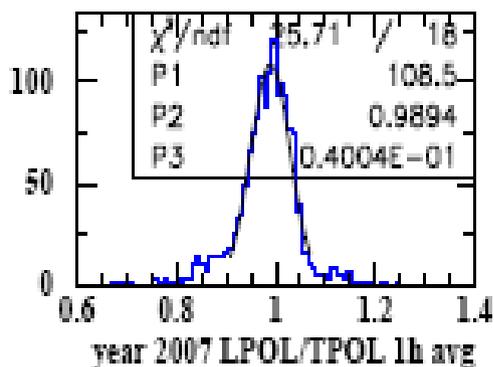
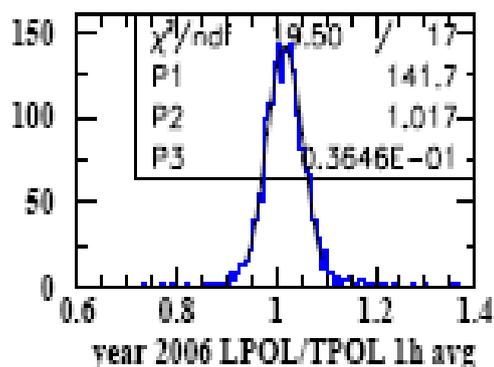
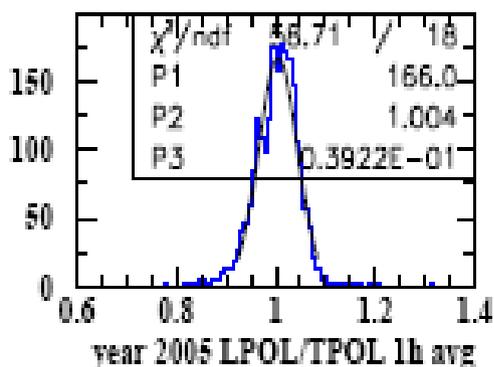
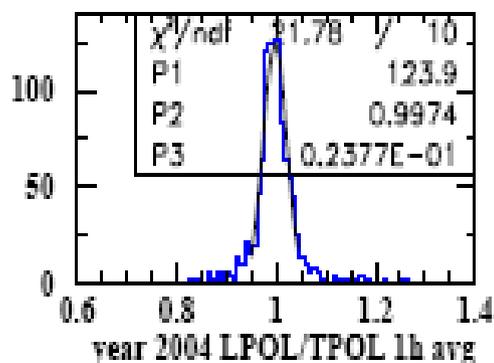
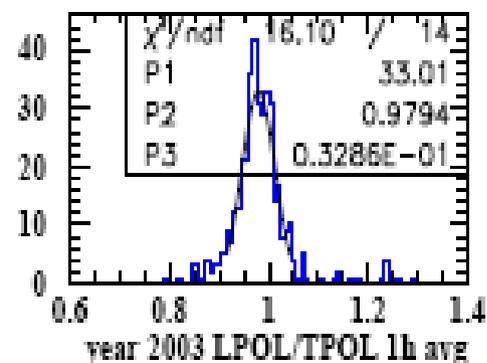
# Polarimeter Summary

Ratio LPOL/ TPOL

Performance summary  
of the polarimeters  
since 2003



# Polarimeter Summary



Ratio LPOL/ TPOL

Performance summary  
of the polarimeters  
since 2003

Summary of ratio

2003	0.979
2004	1.000
2005	1.004
2006	1.017
2007	0.989

Current combined systematic error: 3.4%

# Polarimeter Errors

TPOL

Source	Name	$\Delta P/P(\%)$
Electronic noise		< 0.1
Calorimeter calibration		< 0.1
Background subtraction		< 0.1
Light polarization	$\Delta P_{\text{lin}}/P$	0.1
Focus correction	$\Delta P_{\text{focus}}/P$	1.0
Compton beam centering	$\Delta P_{\text{table}}/P$	0.4
Interaction region	$\Delta P_{\text{IR}}/P$	0.9
Interaction point	$\Delta P_{\text{IP}}/P$	2.1
Absolute scale	$\Delta P_{\text{scale}}/P$	1.7
<b>Total</b>	<b><math>\Delta P/P</math></b>	<b>2.9</b>

LPOL

Source	$\Delta P/P (\%)$
Analyzing power	1.2
- response function	(0.9)
- single to multi photon extrapolation	(0.8)
Long term stability	0.5
Gain mismatch	0.9
Laser light polarization	0.2
Pockels cell misalignment	0.4
Electron beam / laser beam interaction region	0.8
<b>Total HERA I error</b>	<b>1.6</b>
Extra uncertainty for new calorimeter	$\leq 1.2$
<b>Total HERA II error</b>	<b>2.0</b>

Breakdown of systematic errors as reported in the Pol note of summer 2007

# Summary

Current analysis gives 3.4% error on polarisation

Not used in this analysis:

SI detector for TPOL  
combined fit for TPOL analysis

Cavity data are not used at all

There are prospects for improvements  
but personpower is a serious issue