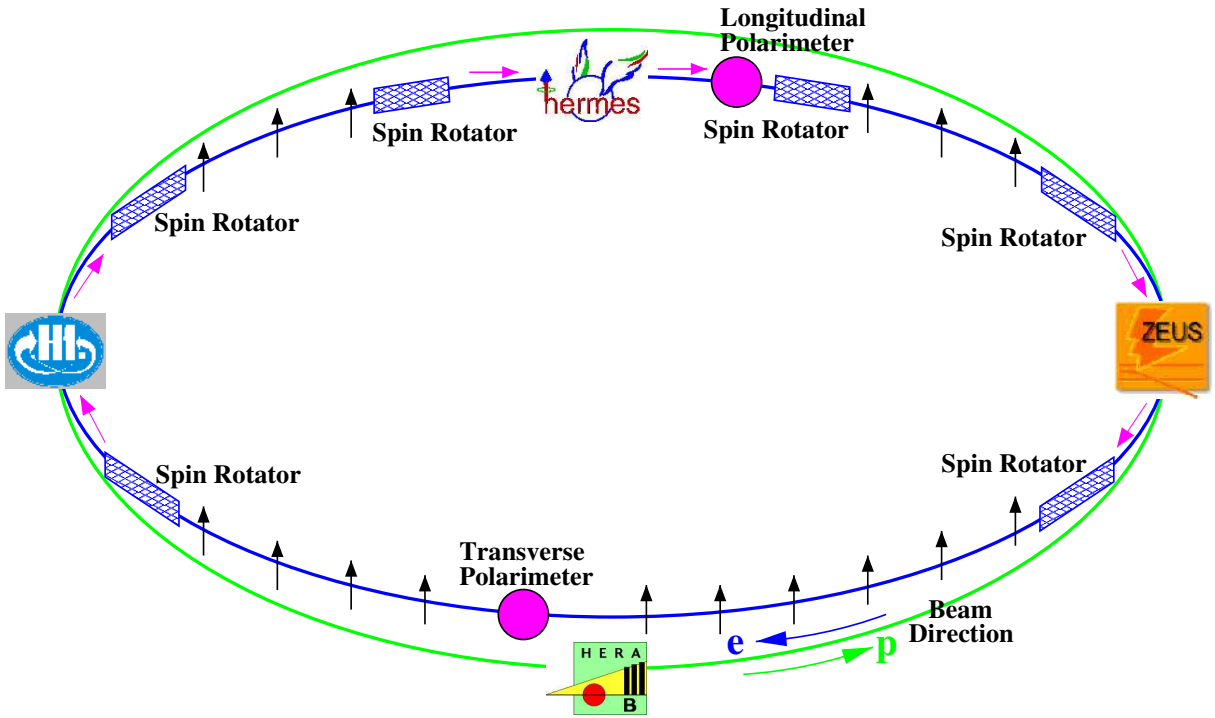
The HERA polarimeters

- Introduction
- Polarimeter status
- Plans for 2004
- Summary

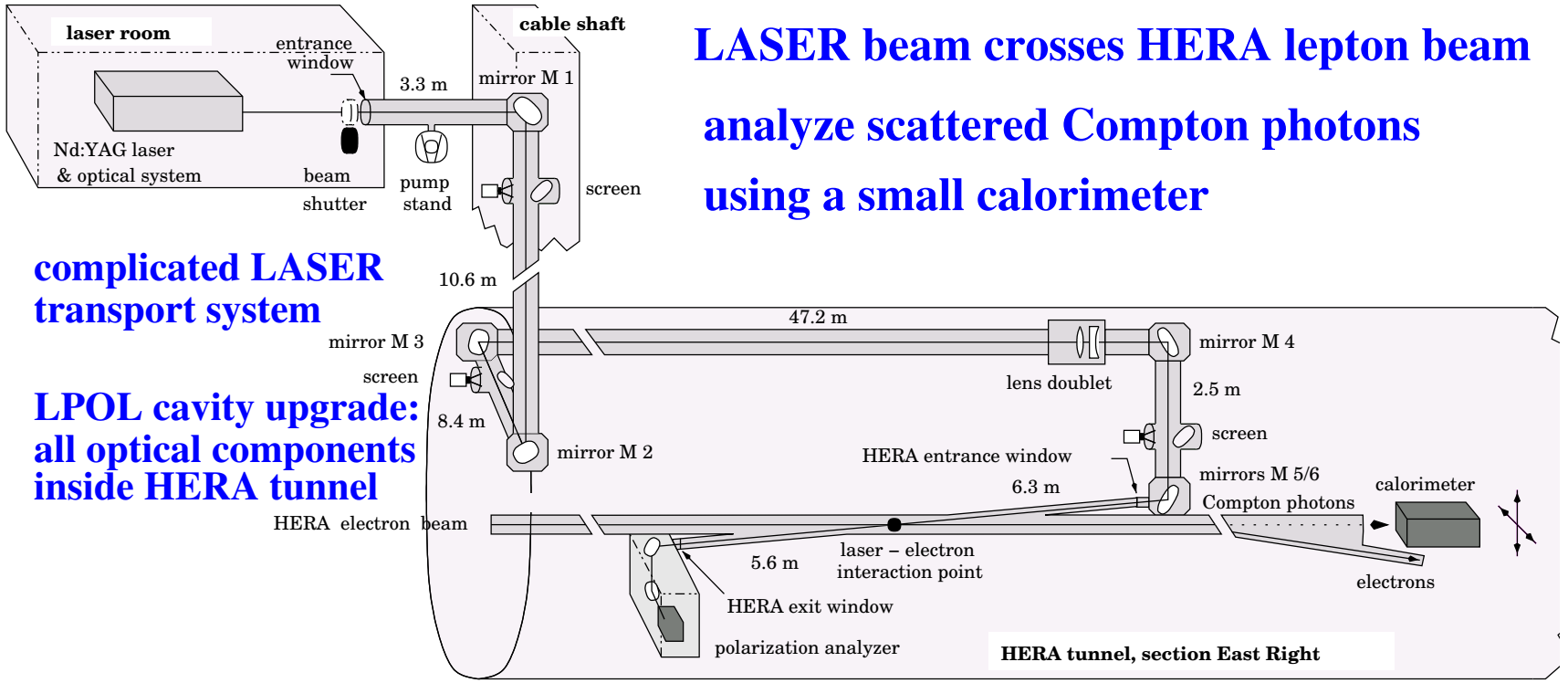
Introduction



Two Compton polarimeters:

- TPOL measures transverse polarisation (longitudinal component is zero near HERA-B)
- LPOL and LPOL cavity measure longitudinal polarisation (transverse component is zero near HERMES)

Introduction (cont'd)



LASER beam crosses HERA lepton beam

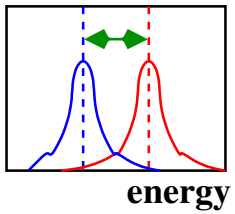
analyze scattered Compton photons

using a small calorimeter

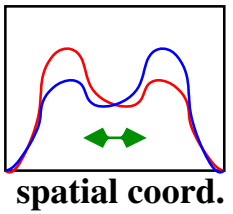
complicated LASER transport system

LPOL cavity upgrade: all optical components inside HERA tunnel

LPOL: measure energy asymmetry between left/right circular LASER light



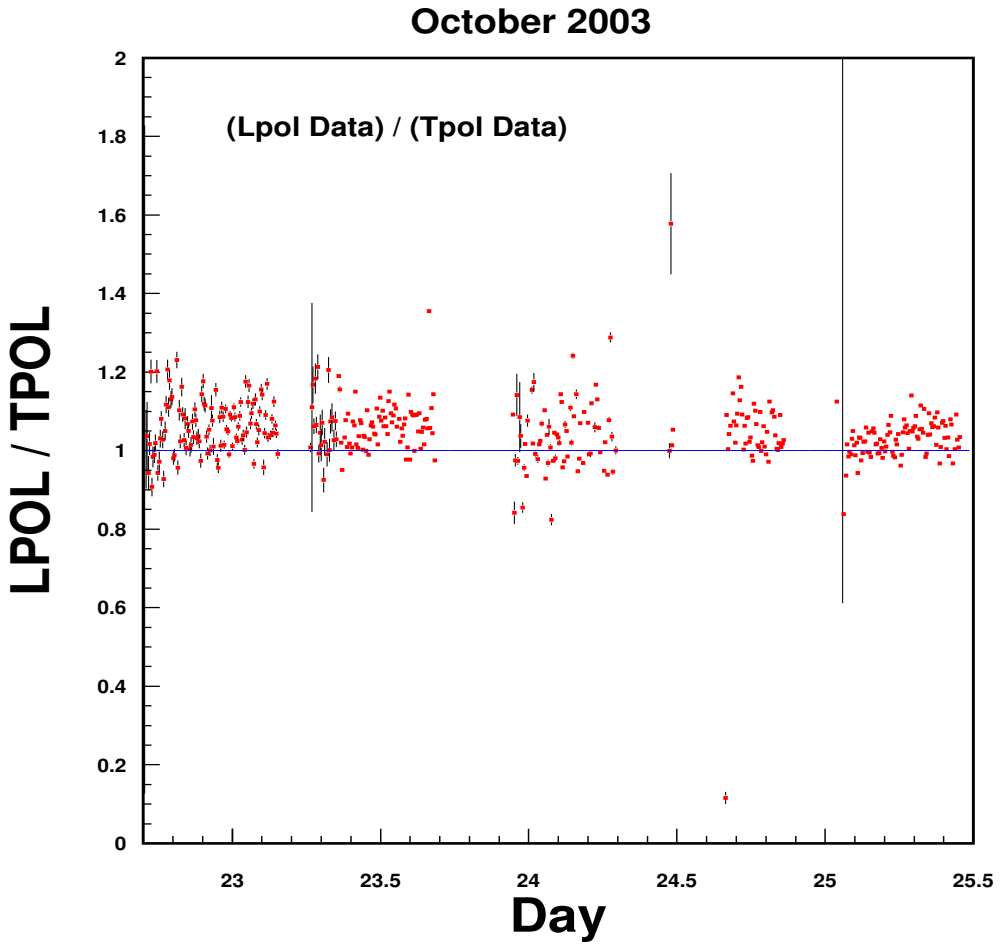
TPOL: measure spatial asymmetry between left/right circular LASER light



Polarimeter status

- Polarimeter operation
  - TPOL: full control by auto-pilot. Experiments inform on-call expert in case of problems. On-call experts are from H1, ZEUS, HERMES, DESY
  - LPOL: controlled by HERMES
  - LPOL cavity: commissioning by experts
- Data quality is monitored in a regular polarimeter meeting
- Polarimeter uptime after shutdown was very good

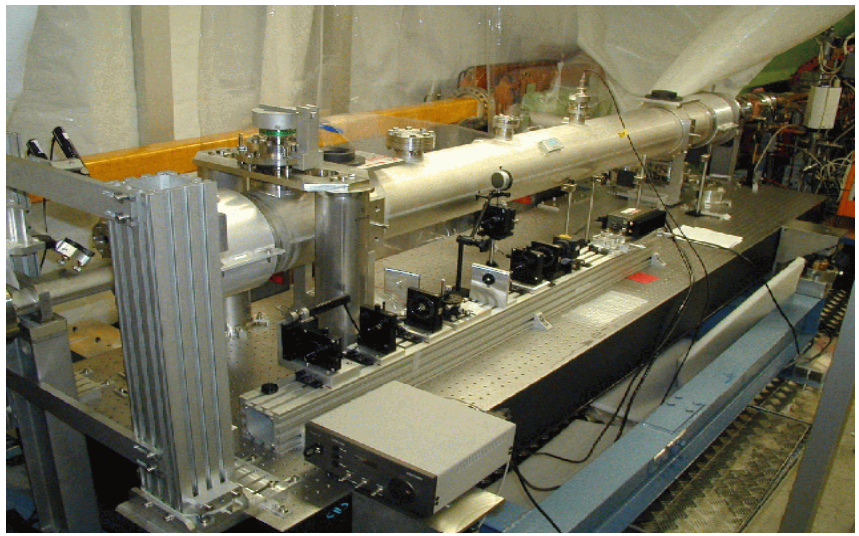
Polarimeter status (cont'd)



- Recent data-quality checks: LPOL/TPOL different from one by 7%
- Investigations ongoing:
  - LPOL and TPOL offline analysis
  - LPOL and TPOL systematic studies (beam position, calorimeter scan, etc)
- Solving this problem has highest priority for the POL2000 group

Polarimeter plans

- Understand LPOL/TPOL absolute scale
- LPOL cavity commissioning. Status:
  - First data collected with new DAQ system
  - Spectra and timing looks ok (but: Bremsstrahlung only)
  - LASER power supply broken (back from repair in 2 weeks)
  - Expert from Lebedev now at DESY for a few months



Polarimeter plans (cont'd)

- LPOL cavity in 2004: build new radiation-hard calorimeter (similar to HERMES luminosity system, H1 e-tagger)
- (old) LPOL: LASER contract expired. Buy spare parts, investigate whether some limited technical support from Coherent is possible.
  - Get LPOL cavity into regular operation as soon as possible
- TPOL: optical component for improved LASER monitoring bought this year. Integrate into regular setup next year
- TPOL silicon detector: collecting data with prototype detector now, exchange detector this winter.
  - Results from prototype-detector will help to understand the absolute calibration of the TPOL

Summary and Conclusions

- Polarimeters are working with high efficiency
- Problems with absolute scale of measurement, under investigation
  - LPOL and TPOL systematic studies
  - Offline analysis
  - TPOL silicon detector
- LPOL commissioning has started, build new radiation-hard calorimeter next year