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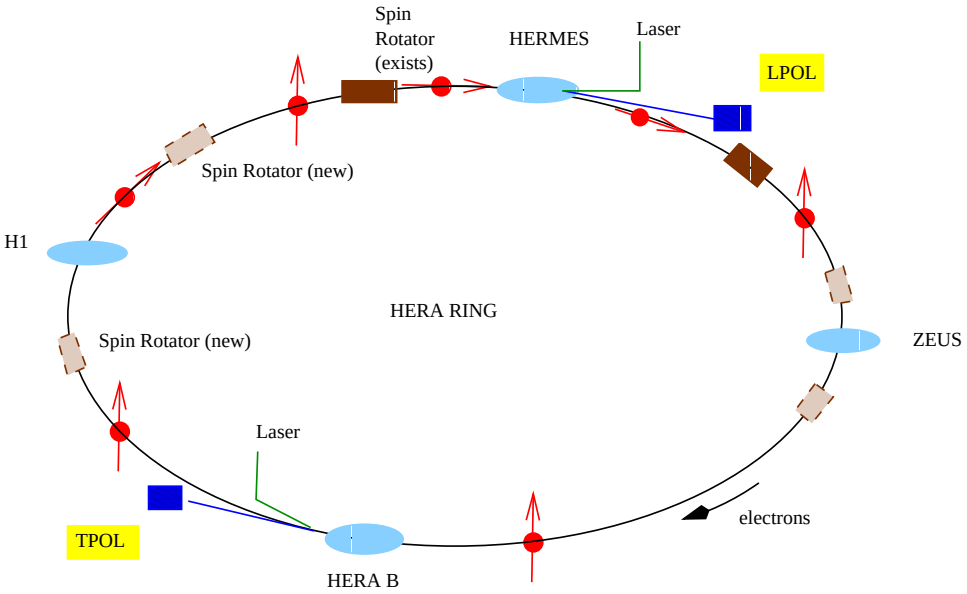
Polarimeter upgrade

— status report —

- Introduction
- Longitudinal polarimeter (LPOL)
- Transverse polarimeter (TPOL)

H1 collaboration meeting, June 23, 2000

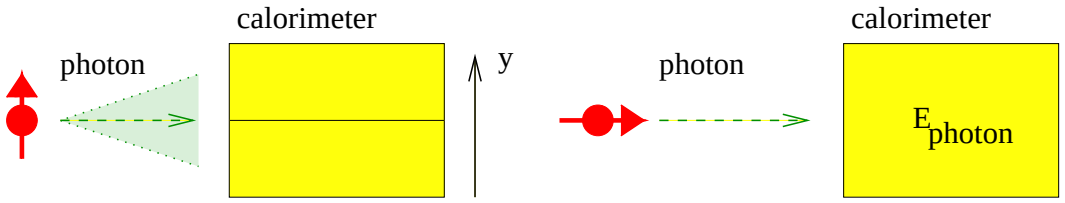
Introduction



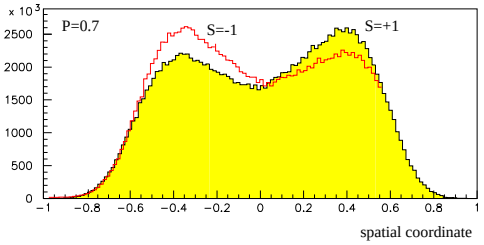
- LPOL: measure longitudinal polarisation between HERMES' Spin-rotators.
- TPOL: measure transverse polarisation far from spin-rotators (detector is located near HERA-b in the tunnel)

Measurement of the polarisation

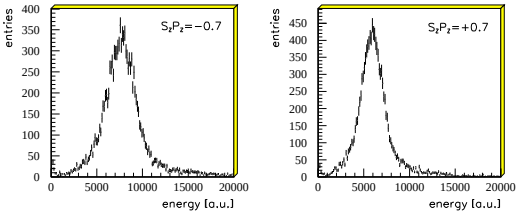
- TPOL: vertikal asymmetry of scattered photons. Continuos laser, one scattered γ in 200 bunch crossings
- LPOL: characteristic energy spectra of scattered photons. Pulsed laser, 100 photons per collision, but low repetition rate.



TPOL



LPOL



Longitudinal polarimeter upgrade

Detailed plans for an upgrade (by F. Zomer and others) with a Fabry-Perot cavity around the interaction point.

$\rightarrow$ could operate LPOL with a continuos laser in single photon mode (up to 1 collision per bunch-crossing).

$\rightarrow$ excellent calibration, best possible measurement of the polarisation. (accuracy $\Delta\mathcal{P} \leq 1\%$ per bunch per minute).

Still waiting for a final decision in the PRC about this project.

Transverse polarimeter upgrade

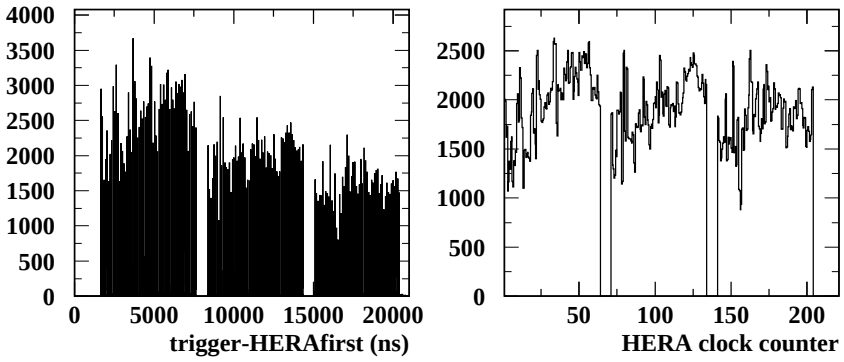
- New data acquisition based on the electronics developed for the new H1 luminosity system.

  $\rightarrow$ bunch identification, improved monitoring and calibration, higher trigger-rates

- Position-dependend detector in front of the TPOL to support the calibration (transformation of energy-asymmetry to spatial coordinate is currently the dominating systematic uncertainty).

DAQ integration

Integration of the new DAQ is progressing very well (based on prototype-electronics of the lumi-system). Operated in parallel to the existing TPOL DAQ.

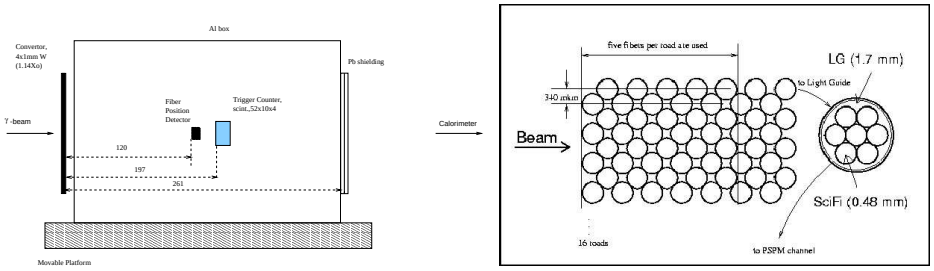


→ Identification of the electron bunch with the TPOL is working well. Expect polarisation measurements soon.

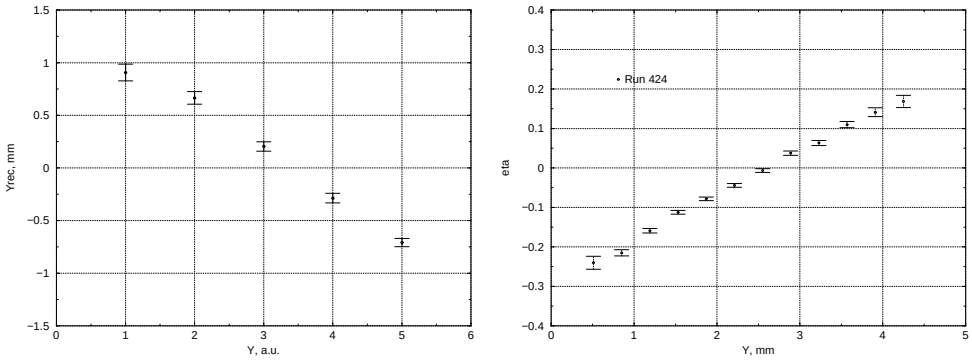
Need to define in the near future which data is needed by the experiments and the machine group, where to store it, etc.

Position sensitive detector

Tests with a fiber-detector are going on, first results look encouraging. For July/August tests are scheduled with a Silicon-detector.



Test setup of the fiber-detector located in front of the TPOL calorimeter



Results from the fiber-detector: position scan and $\eta - y$ transformation (analysis by Alexander Usik)

Summary

- LPOL upgrade: waiting for final decision
- TPOL upgrade:
  - Integration of the new DAQ is progressing very well. Expect measurements of the per-bunch polarisation from the TPOL in the near future.
  - Tests with position-dependend detectors look encouraging. Installation of such a device in front of the TPOL calorimeter during the shutdown is very likely.