

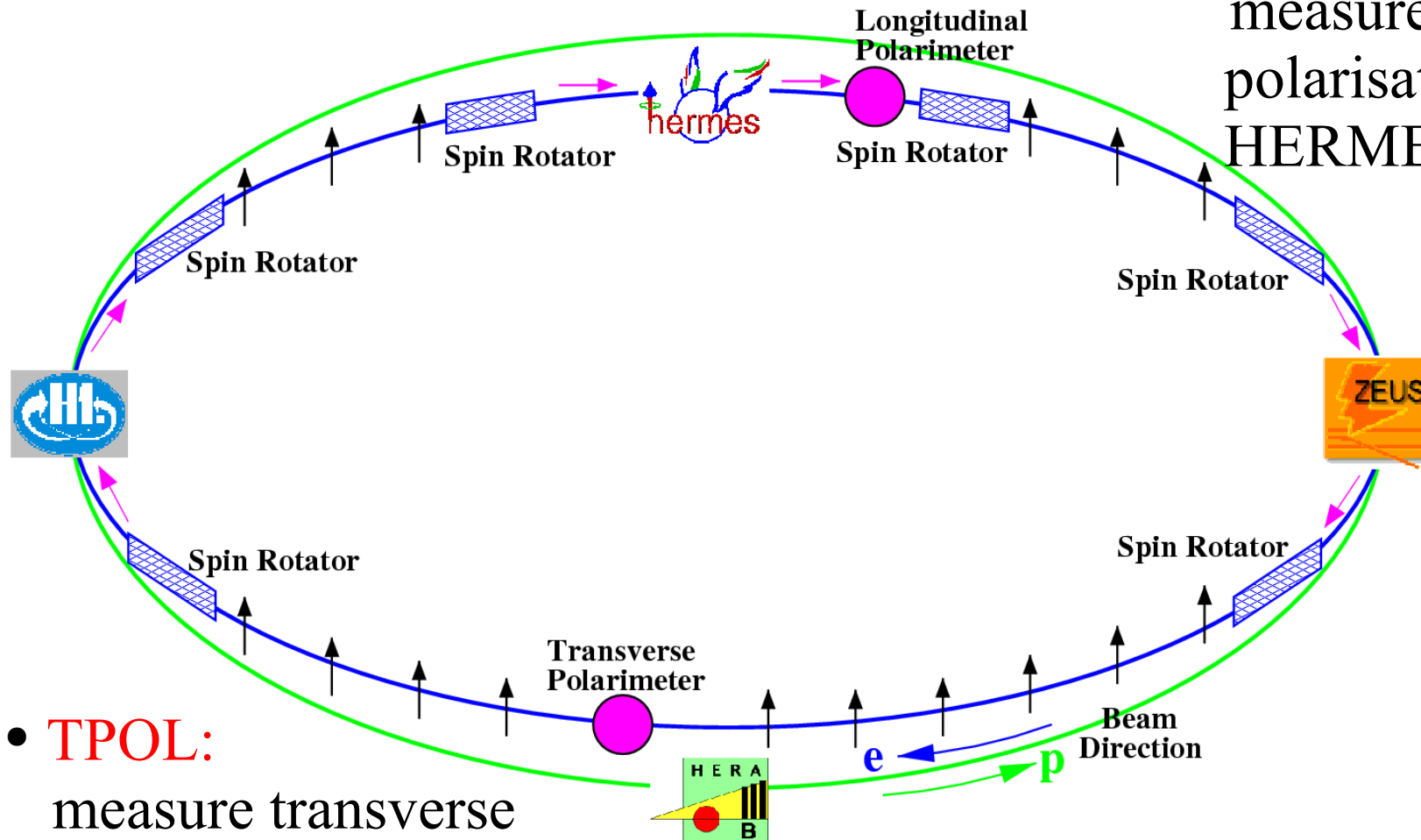
Polarimetry Group Status Report

Matthew Beckingham
Technical Plenary
H1 Collaboration Meeting
16/6/05

- Introduction
- TPOL/LPOL Status
- Cavity LPOL recommissioning
- New Calorimeter

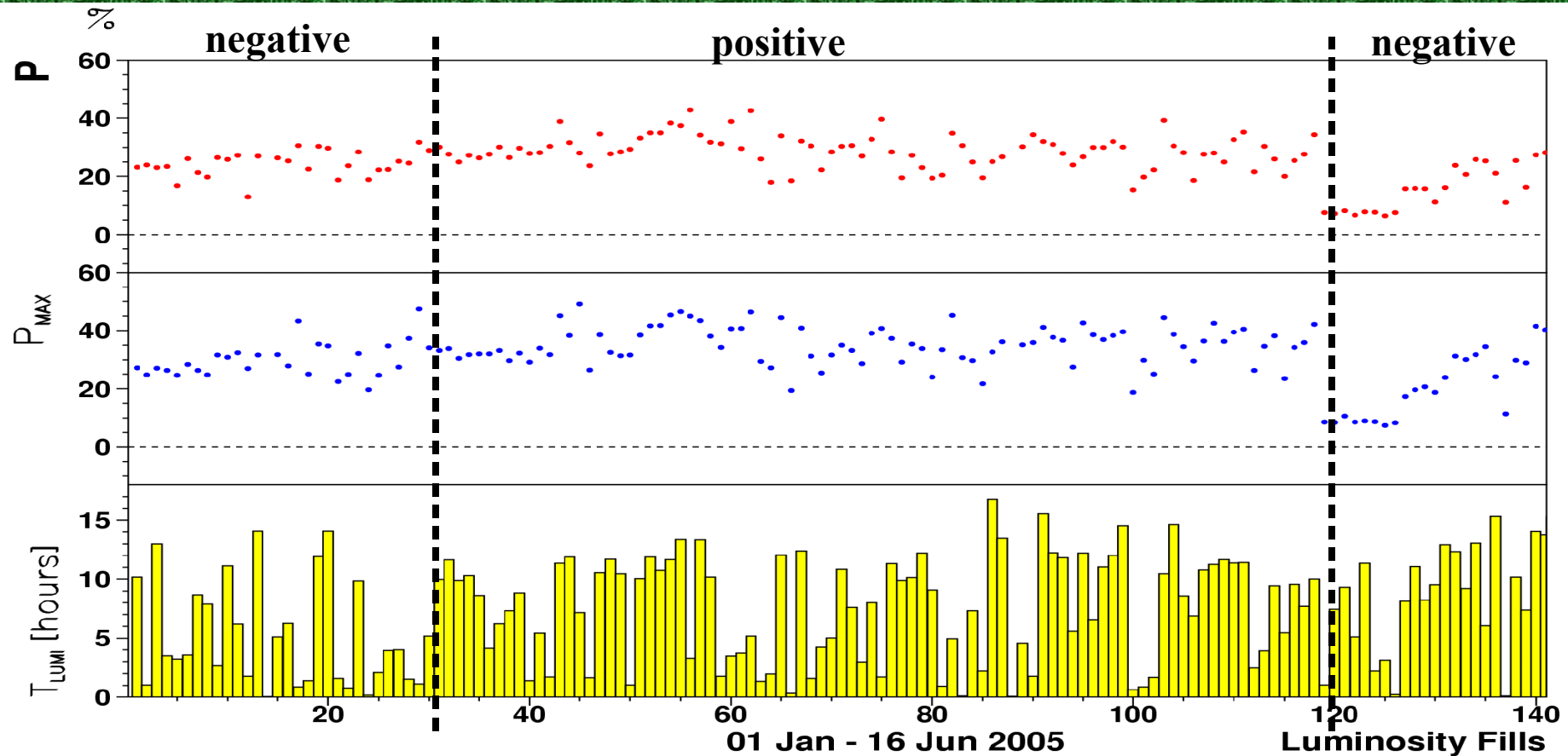
Reminder

- **LPOL + LPOL Cavity:**
measure longitudinal polarisation between HERMES spin rotators



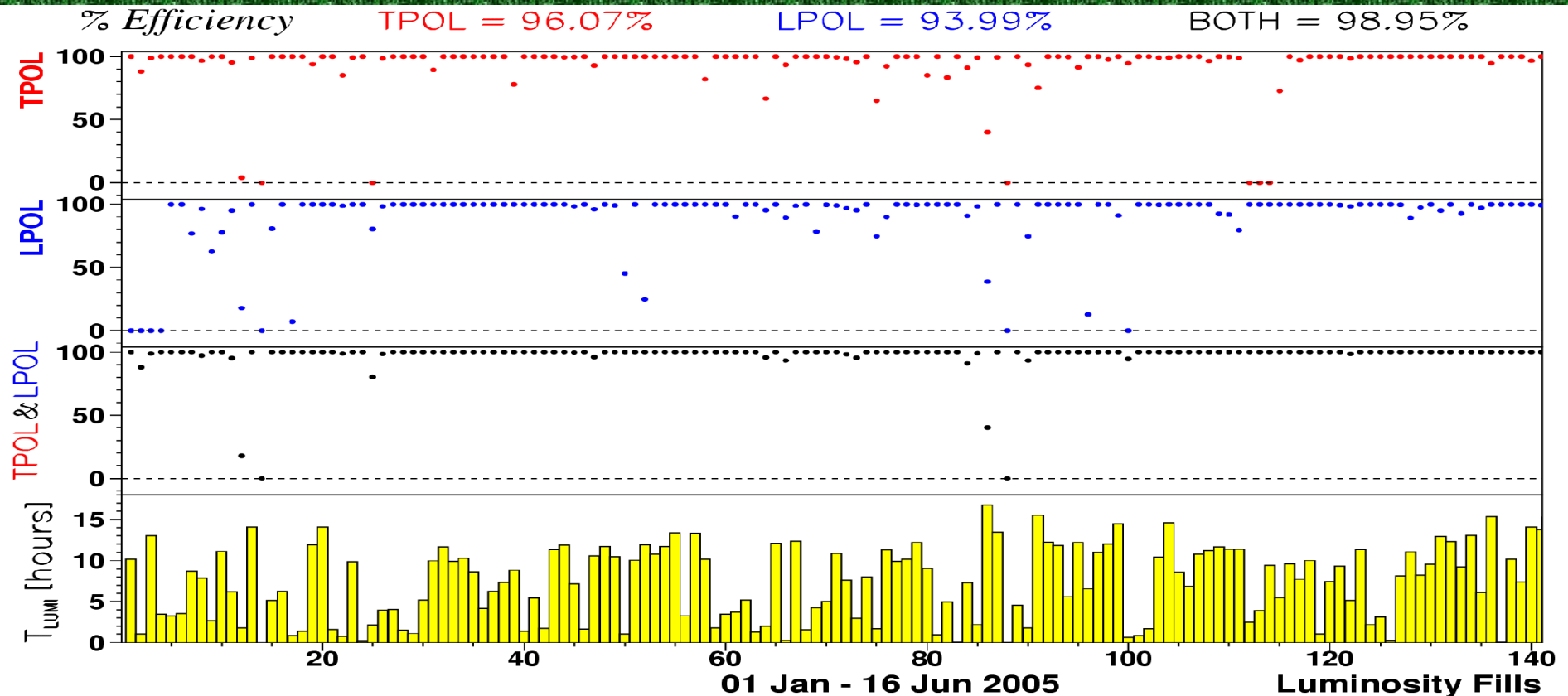
- **TPOL:**
measure transverse polarisation far from spin rotators

Polarimeter Performance: Measurements



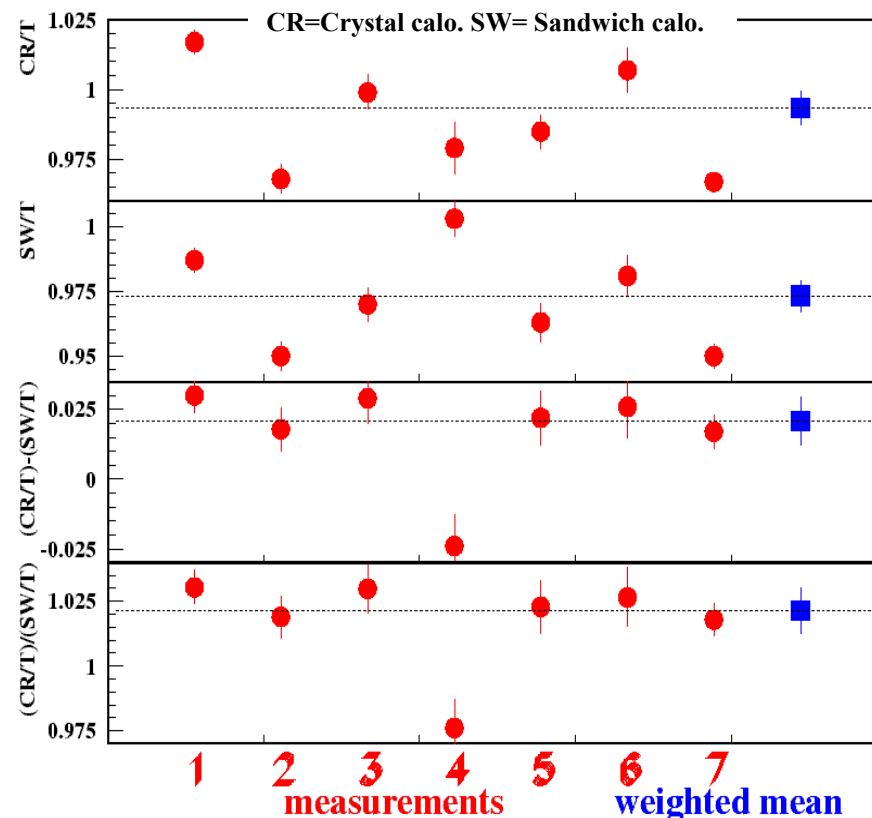
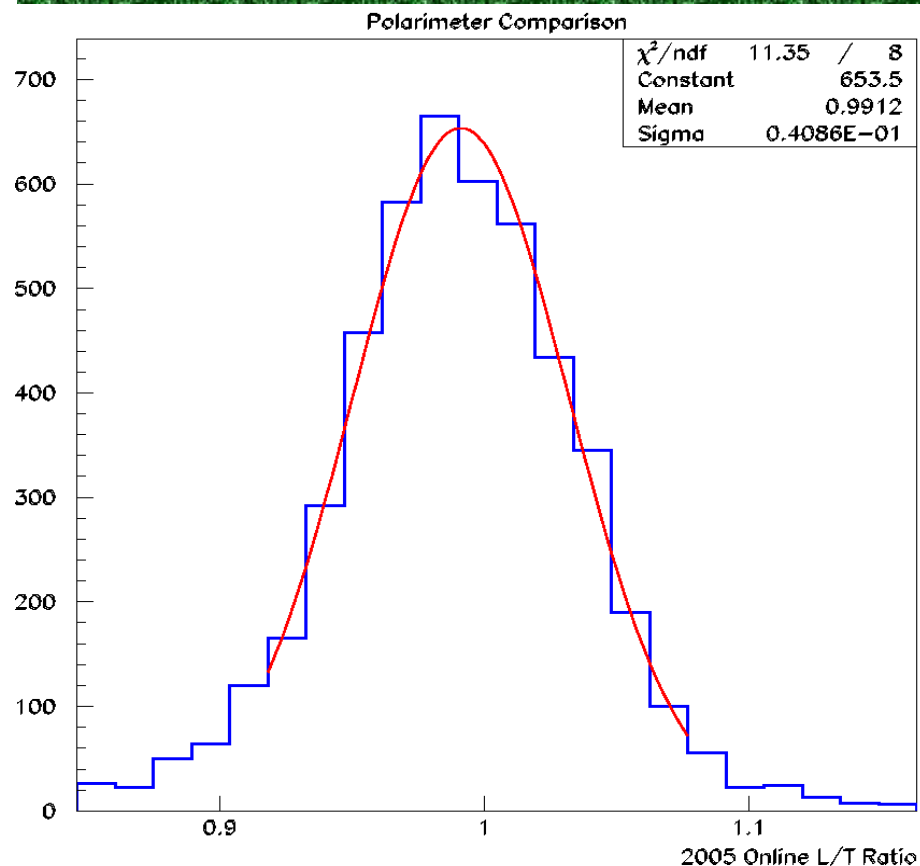
- Polarisation rather low ($<30\%$) compared to previous years
- No clear tendency in polarisation with time
- Polarisation too low for experiments liking
=> ongoing studies by HERA in discussion with exps.

Polarimeter Performance: Efficiency



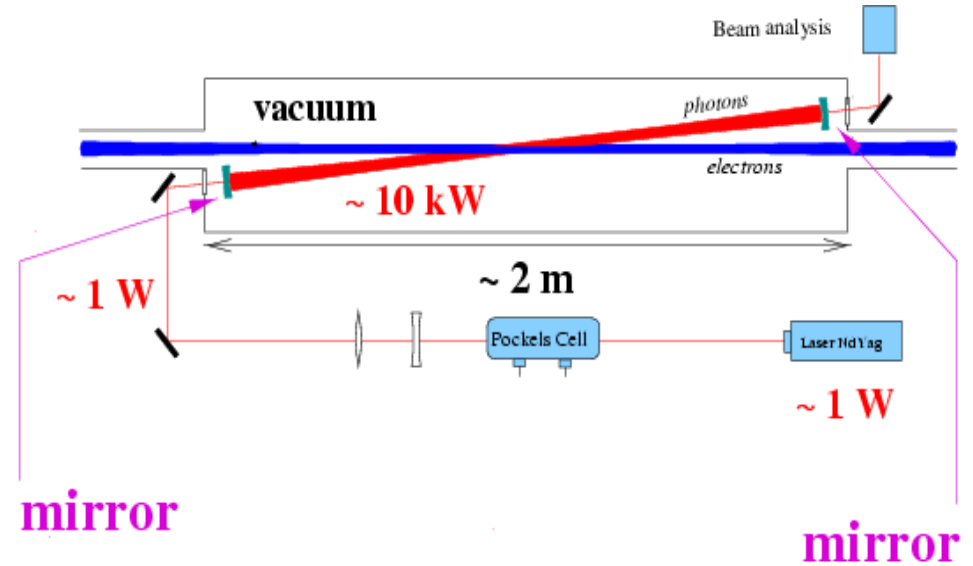
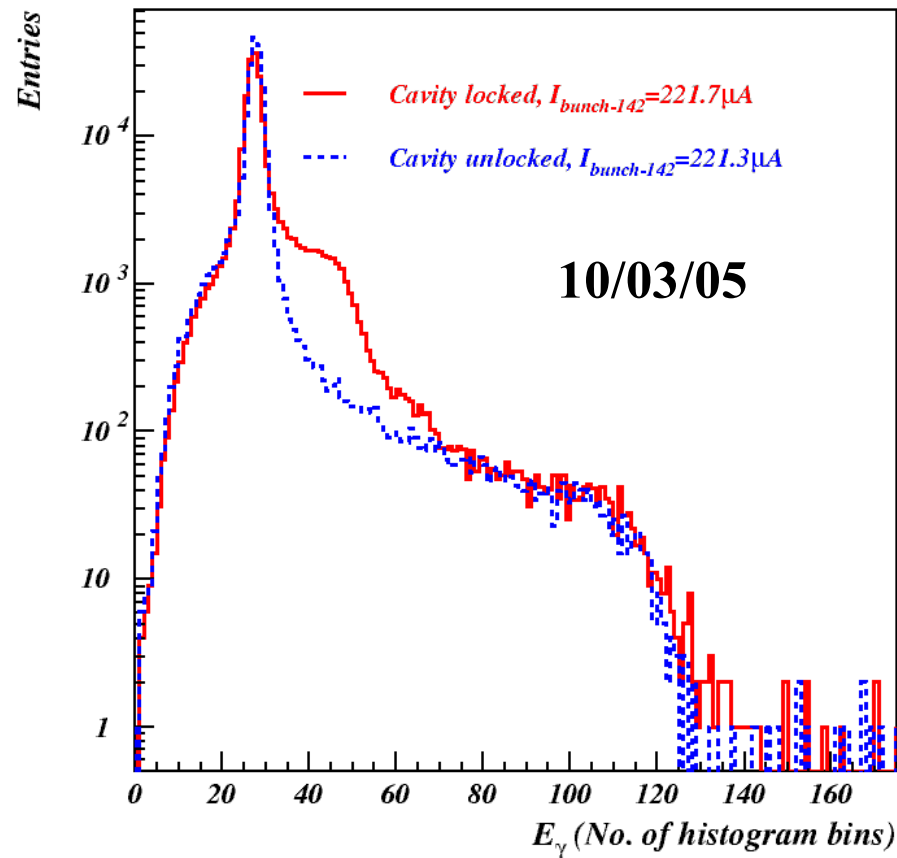
- Efficient operation of polarimeters in 2005, some time for:
 - LPOL**: Installation of repaired calos. (start of 2005), systematic studies and cavity studies
 - TPOL**: vacuum window leak (14/5/05), sporadic hardware electronics problems
- Combined efficiency = 98.3% => polarimeters working efficiently**

LPOL and TPOL



- Compare TPOL+LPOL values
- Data (1/1-20/5) show good agreement at online level (no data quality corrections)
- Check new crystals in reconstructed calo
- Good agreement (2%) between crystal and sandwich calos
- Detailed sys. studies ongoing

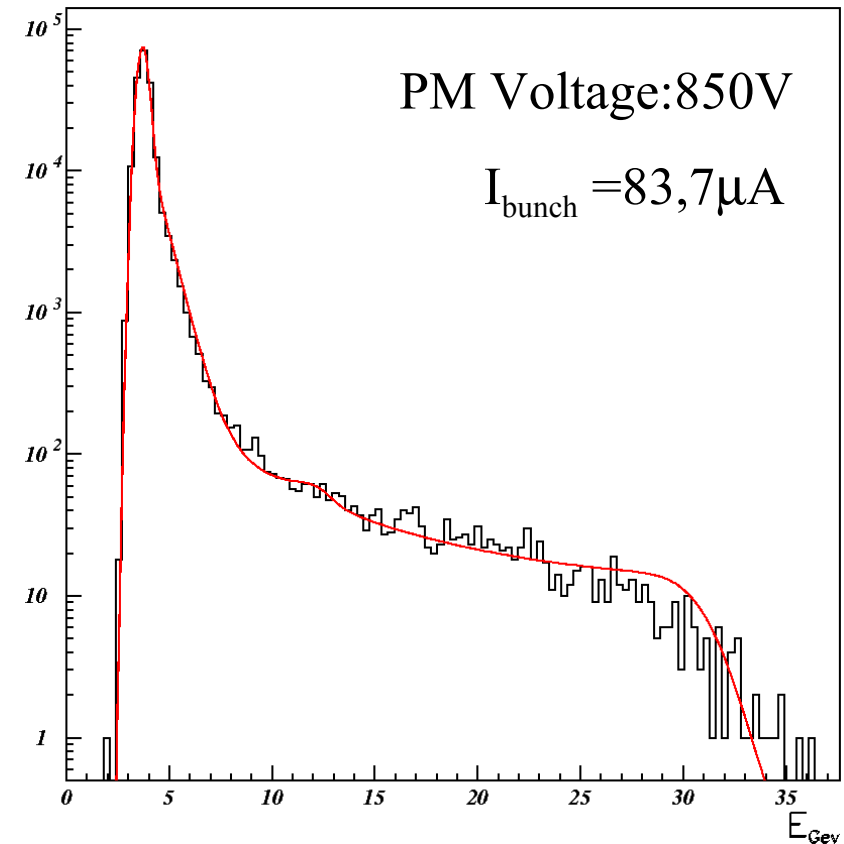
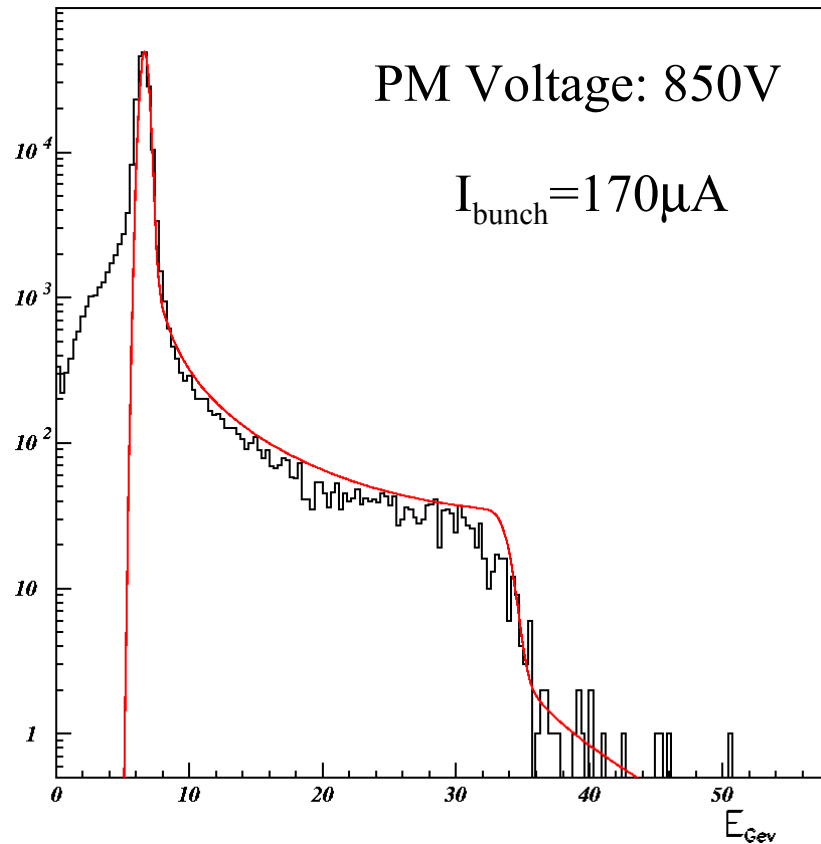
Cavity LPOL: first Compton photons



- Recommissioning still progressing
- Clear signal of Compton photons above Bremsstrahlung spectrum
- Estimation gives rate of 0.1 photons per bunch crossing

New Cavity is recording Compton events

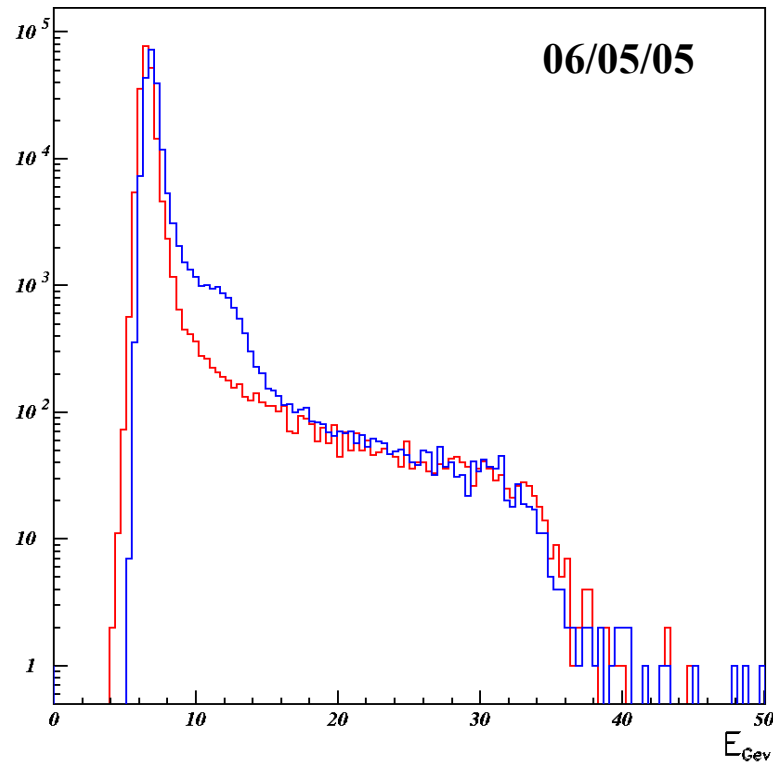
Cavity LPOL: Brems spectra



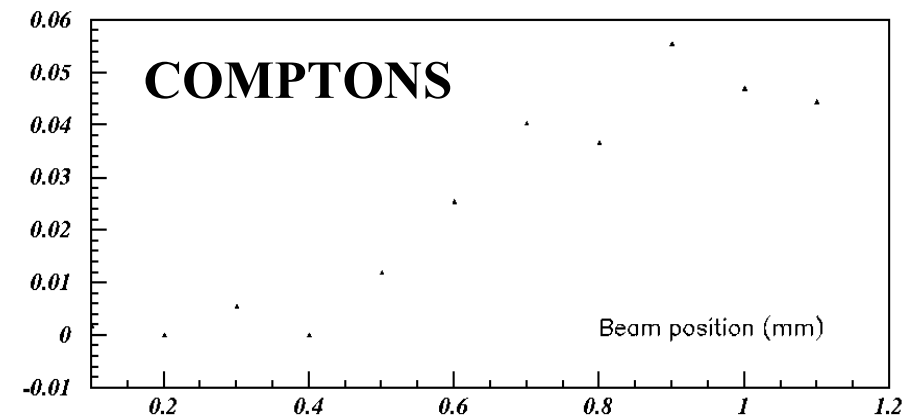
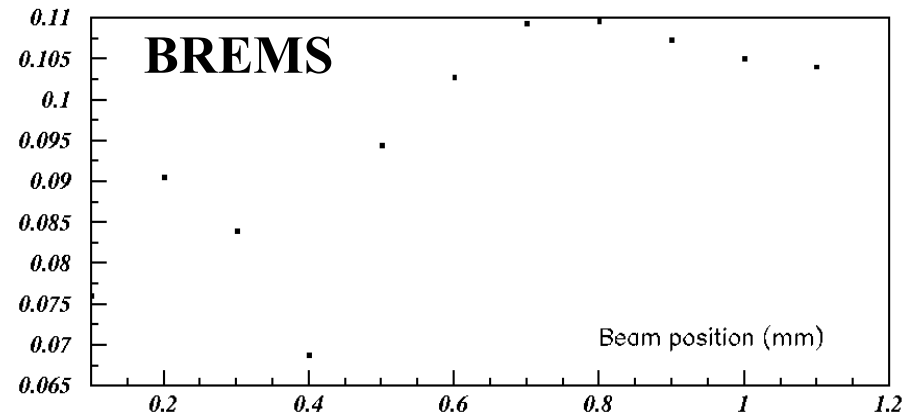
- Problems with electronics readout induced shoulder
=> now removed
- Synchrotron radiation shift reduced by $1X_0$ W in front of calo

Bremsstrahlung spectra now understood

Cavity LPOL



- Locking stable under all normal accelerator conditions
- Laser pol. switching working
- DAQ problems under study

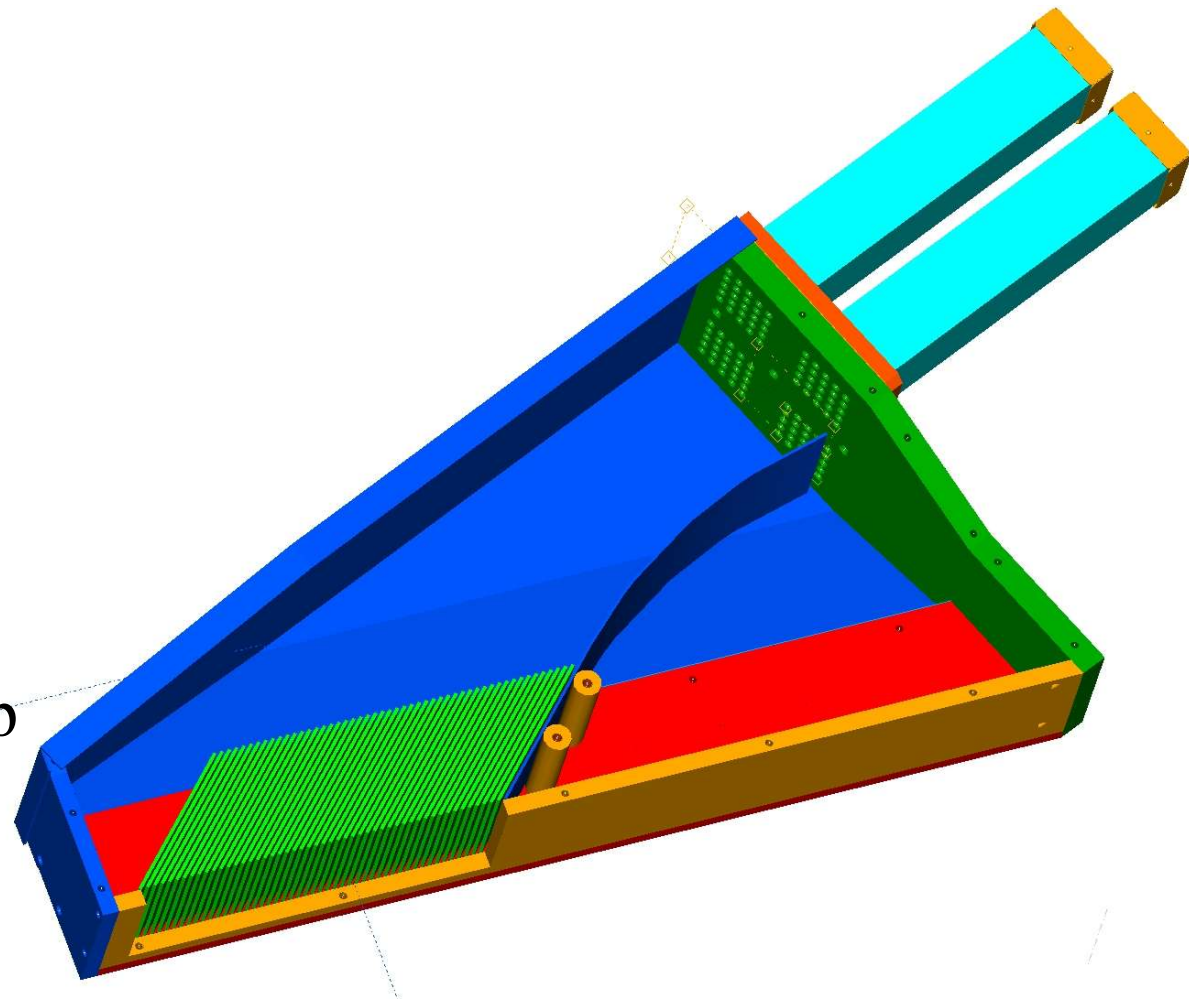


- e Beam scan for optimisation of Compton signal

Cavity LPOL is on way to delivering polarisation measurement

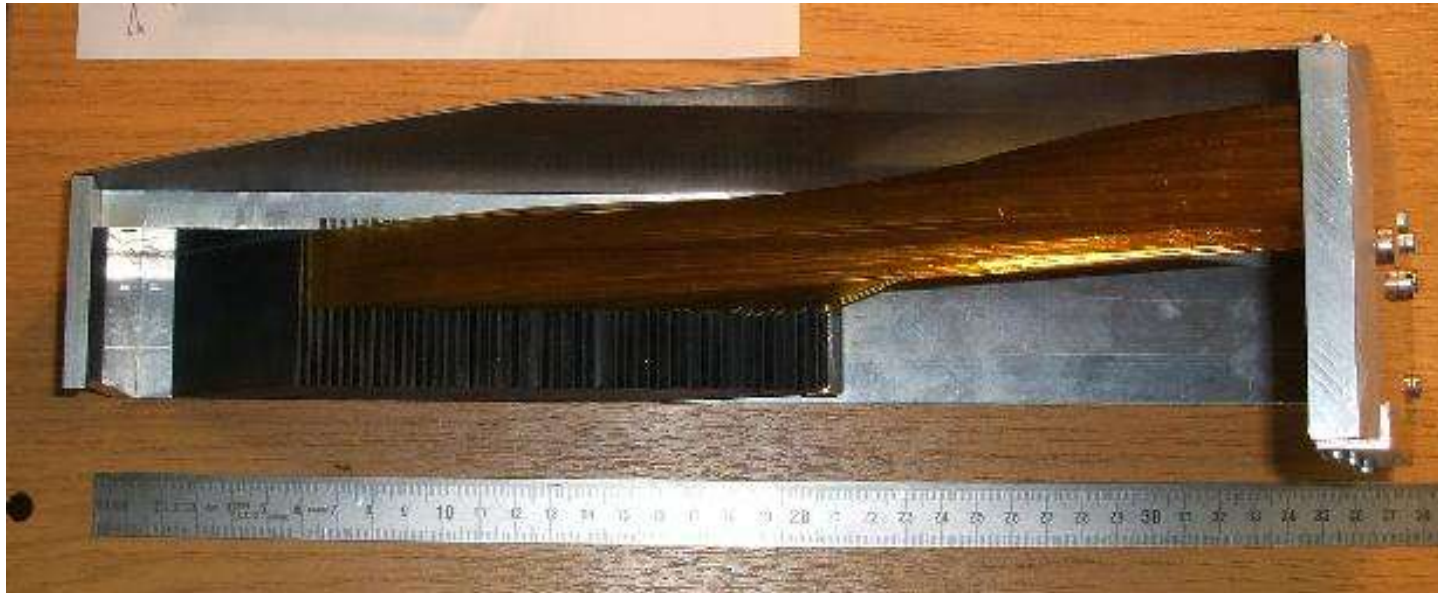
New LPOL Calorimeter

- Design:
 - tungsten/quartz fibre sandwich calorimeter
 - radiation hard, compact
 - 45° tilt to maximise Cherenkov signal
- Full GEANT3 simulation
- Note sent to POL2000 group on design (01/05)
- Design by H1 with input from POL group
- Construction by H1



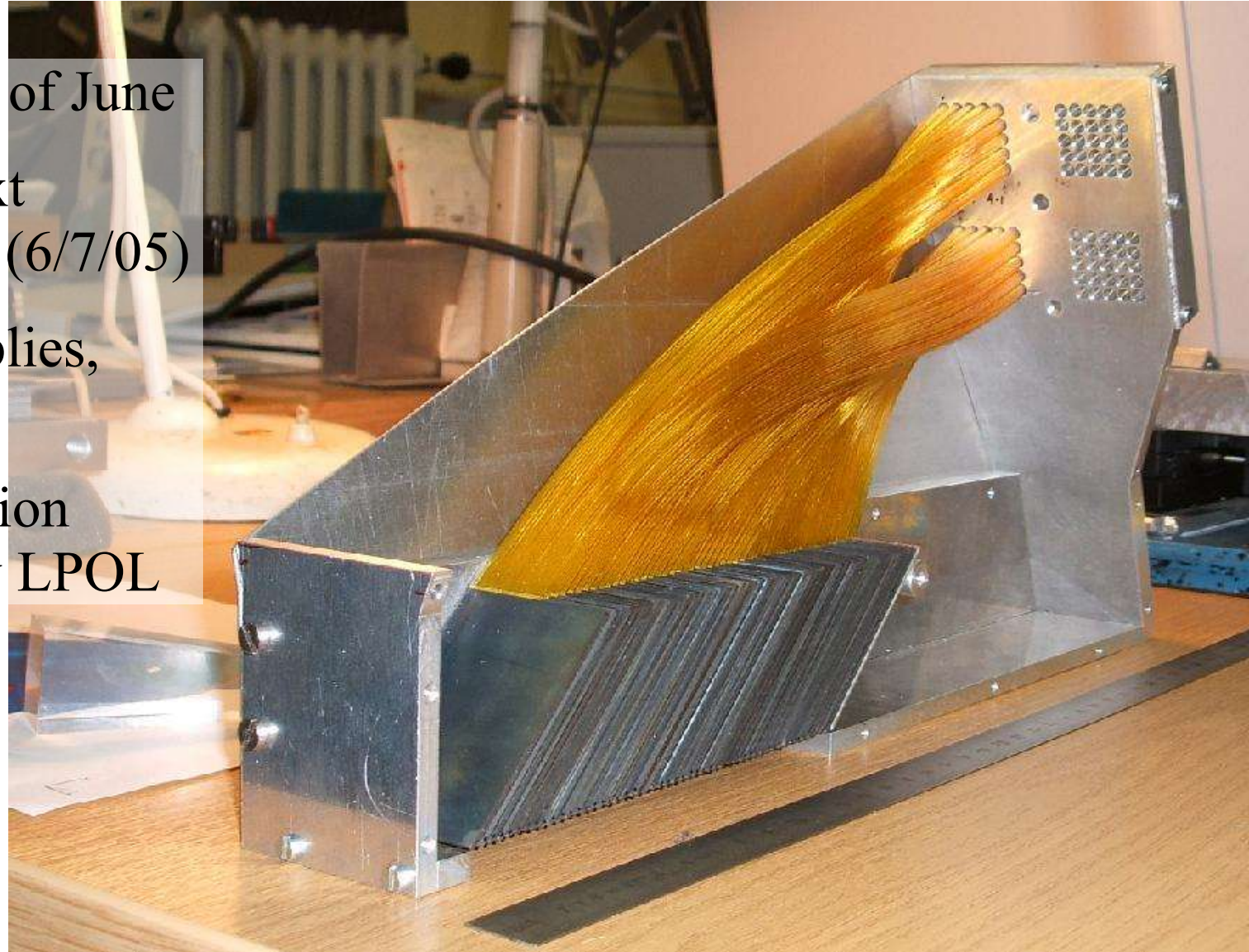
New LPOL Calorimeter: Progress

- Mechanical construction produced
- ~Half of fibres inserted (~420 m)
- Remaining fibres very soon
- PMTs, wave guides from SpaCal



New LPOL Calorimeter: Plans

- Test beam at end of June
- Install during next maintenance day (6/7/05)
- Have power supplies, readout already
- Bring into operation along with cavity LPOL



New calorimeter available soon

Conclusions

- Polarimeters working reliably:
 - 2005 efficiency: LPOL = 91%, TPOL = 94%, comb. = 98.3%
 - Polarimeters in agreement within systematics
- Cavity LPOL commissioning progressing
 - Procedure for laser/e-beam interaction now established
 - Bremsstrahlung spectrum is understood
 - DAQ problems being studied
- New calorimeter being built
 - Time for measurements with DESY test beam
 - Install during July maintenance day