# Polarimetry Group Status Report

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Technical Plenary

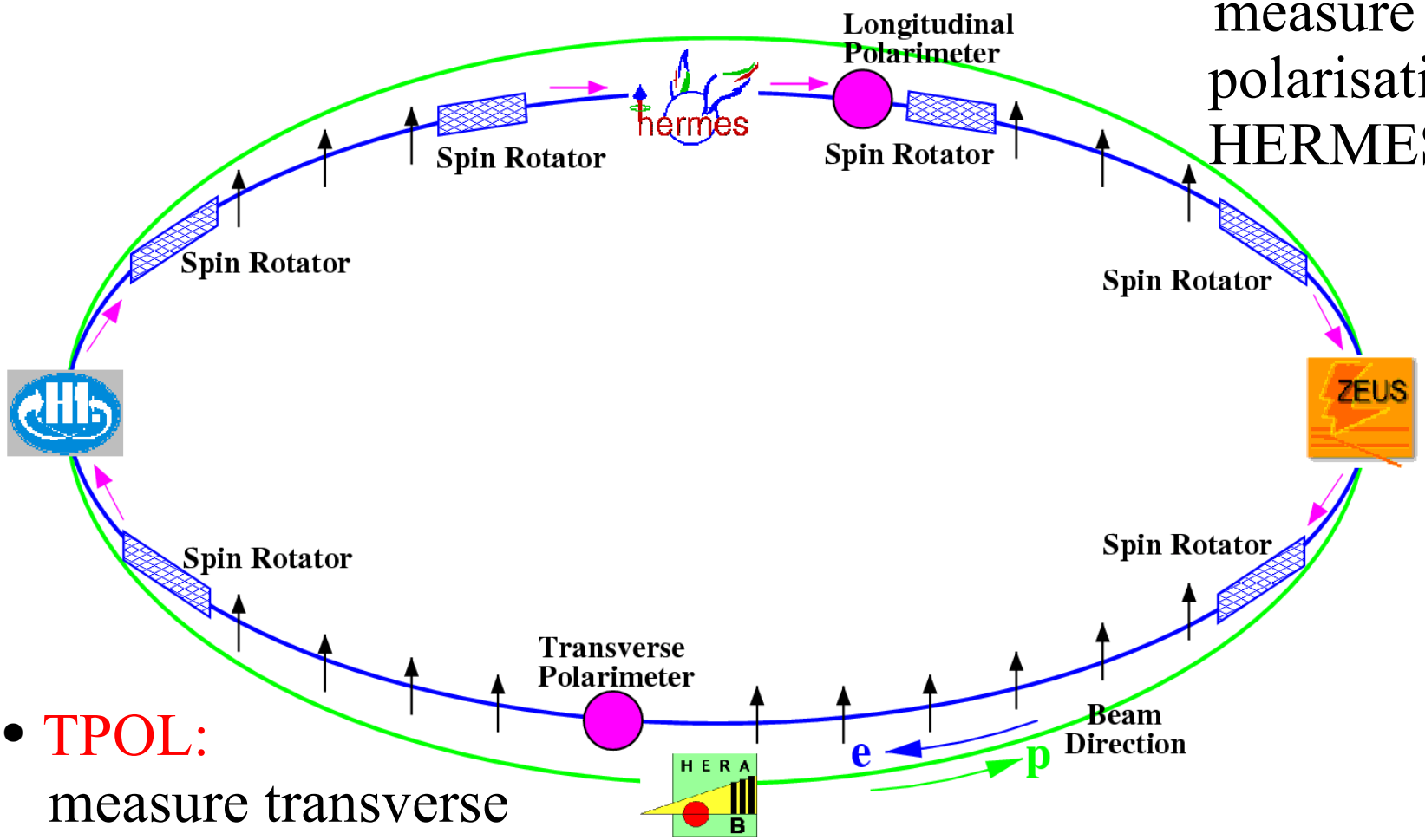
H1 Collaboration Meeting

16/2/05

- Introduction
- TPOL
- LPOL repairs
- Cavity LPOL recommisioning
- New Calorimeter

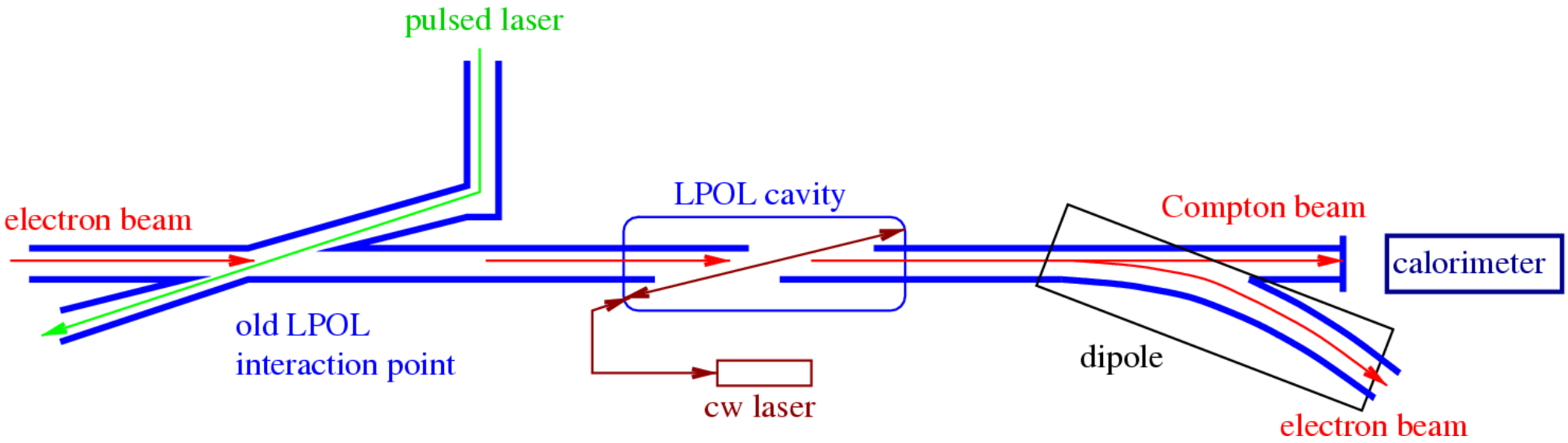
# Reminder

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




- TPOL: measure transverse polarisation far from spin rotators

# Reminder 2



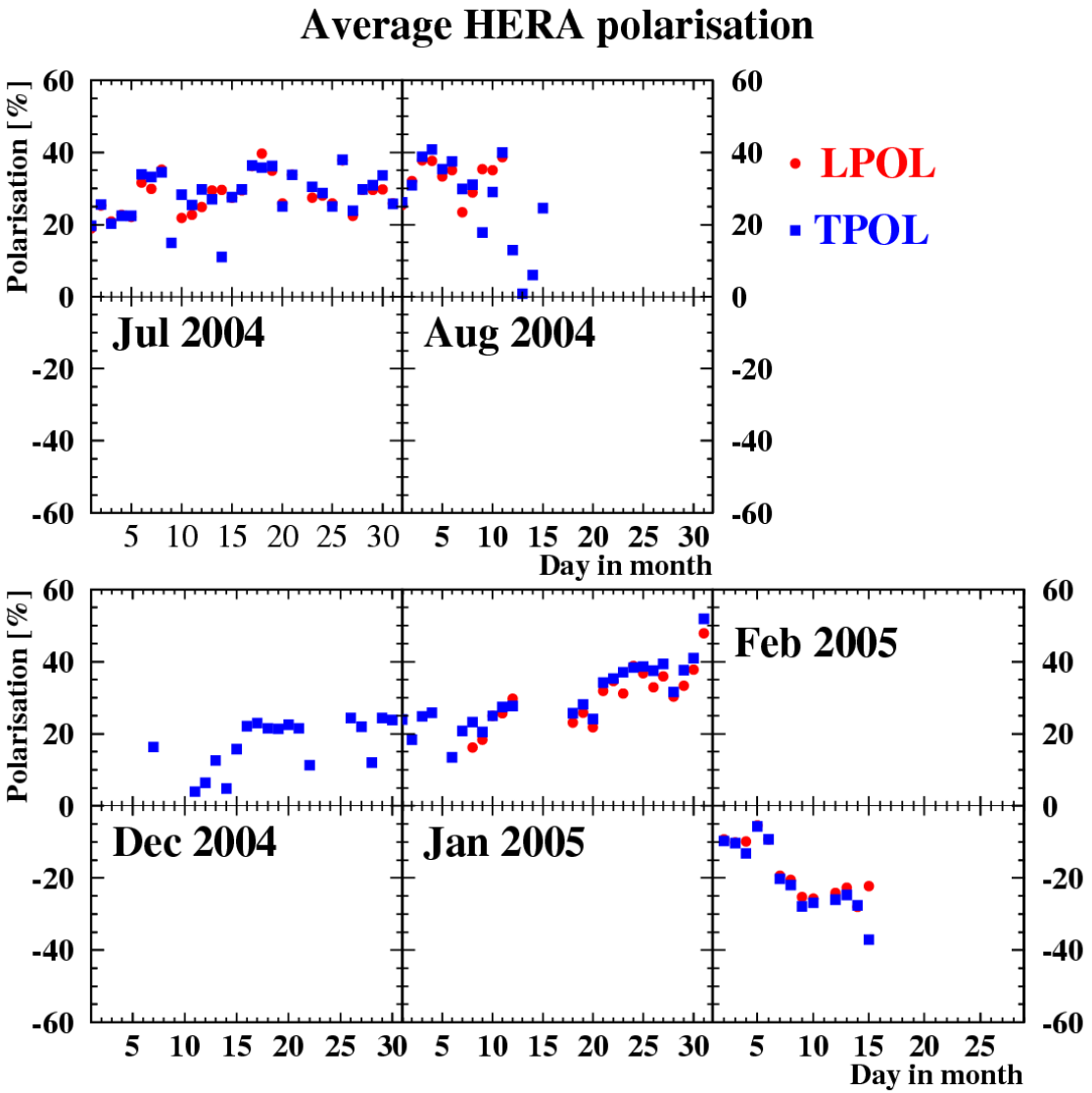

Principle:

- Compton scatter laser light off polarised electron beam
- measure Compton photons in calorimeter
  - LPOL: measure energy
  - TPOL: measure energy asymmetry

=> Polarisation measurement

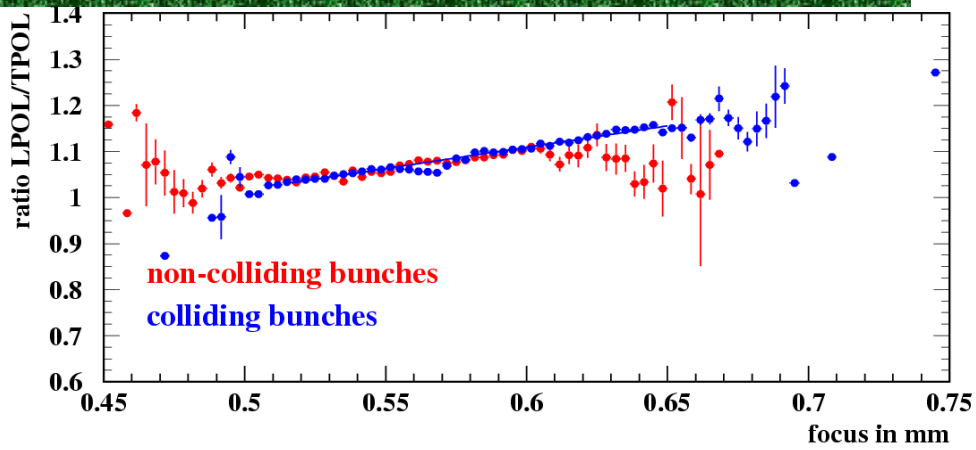
# Polarimeter Performance

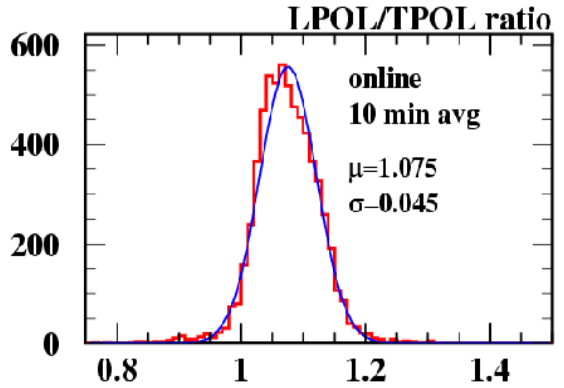
- Good operation of polarimeters since last meeting
- LPOL calorimeters reinstalled in early January
- Problem writing to ORACLE in Dec/Jan, but
  - data collected in period
  - data put into database by hand
  - problems now fixed

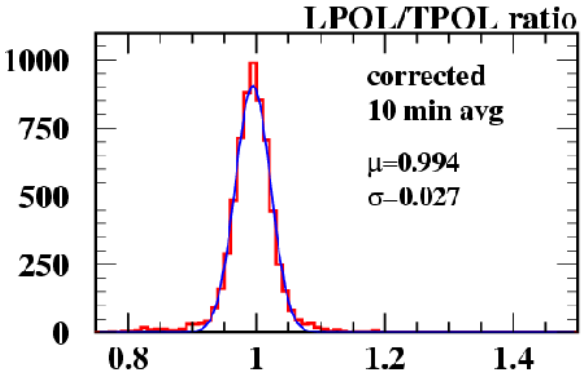


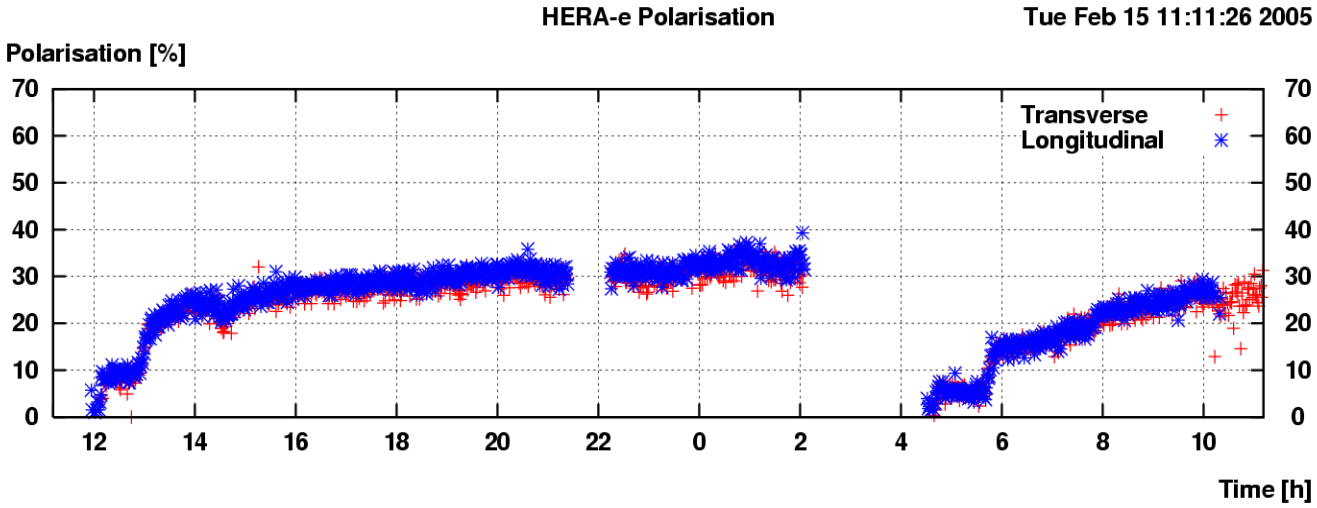
# TPOL

- Good hardware operation since last Collaboration meeting
- Detailed studies (with LPOL) carried into LPOL/TPOL ratio disagreement
- Focus correction now applied online to data => LPOL ≈ TPOL



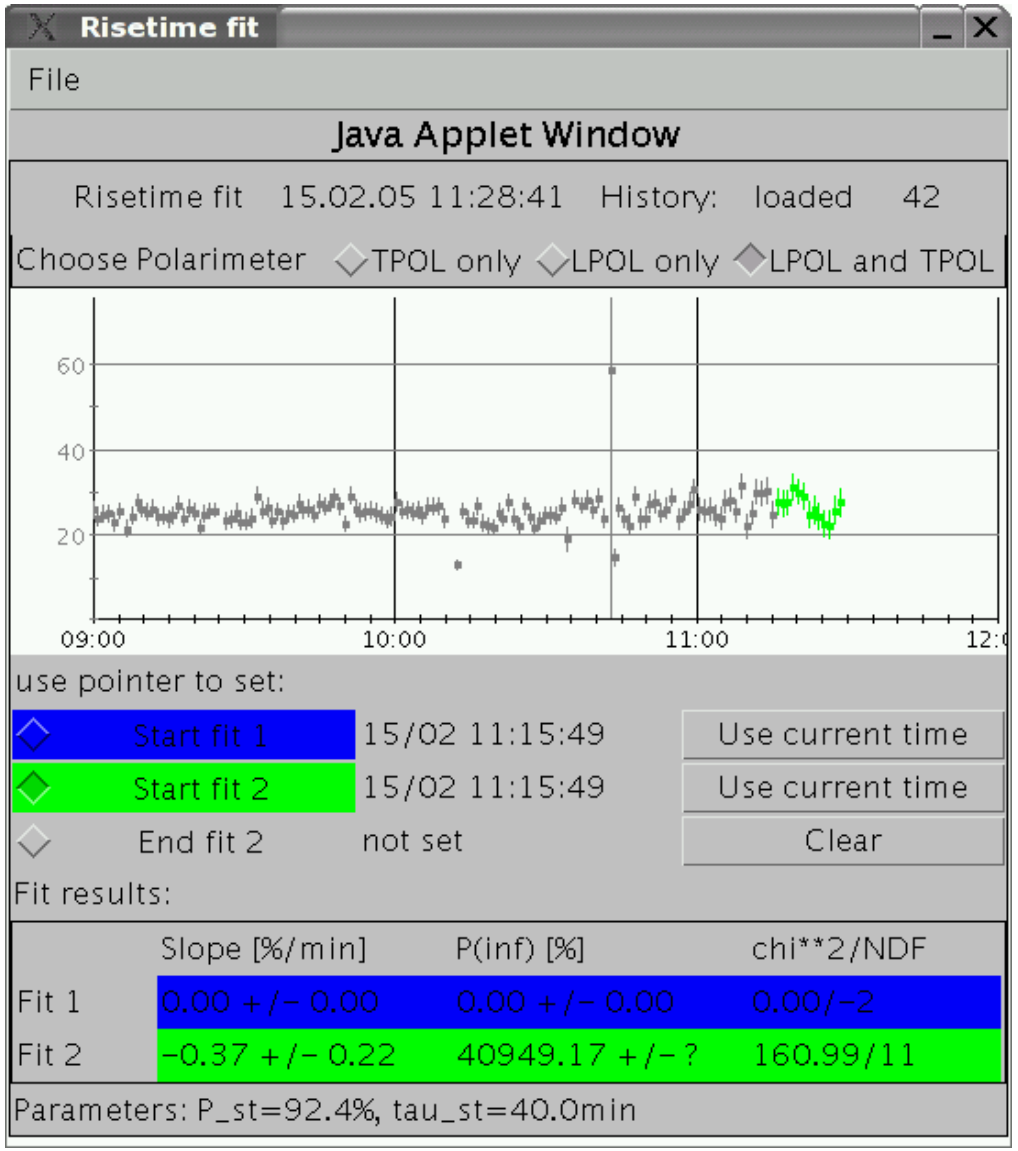



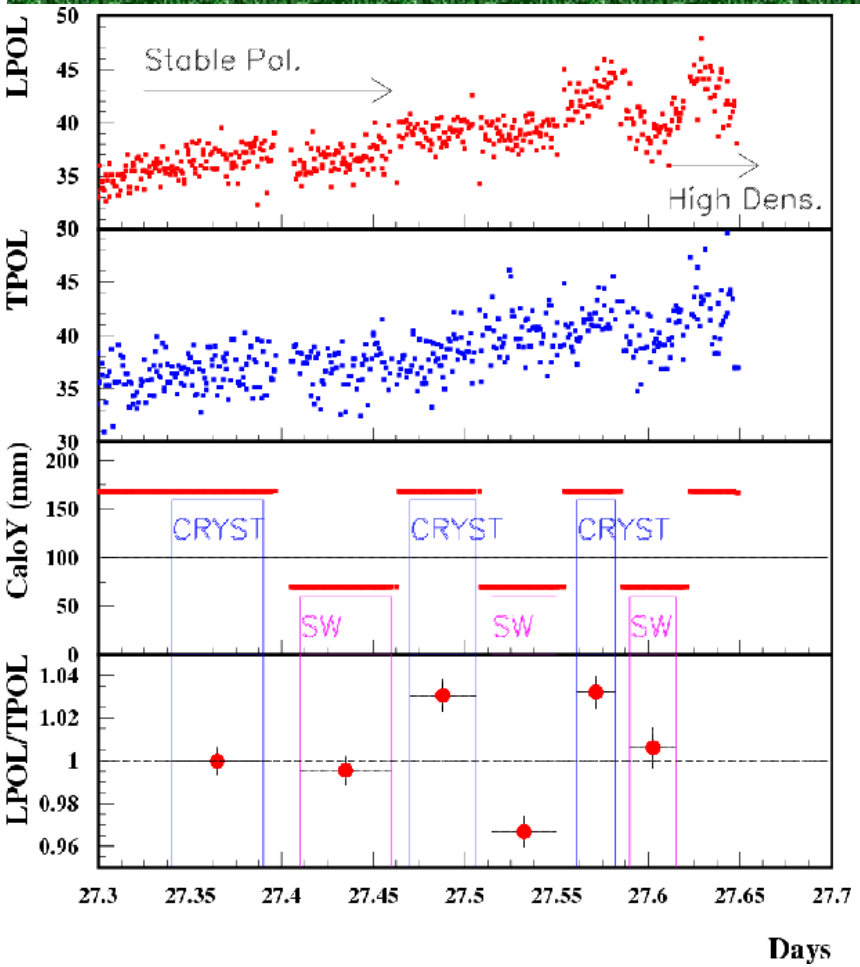



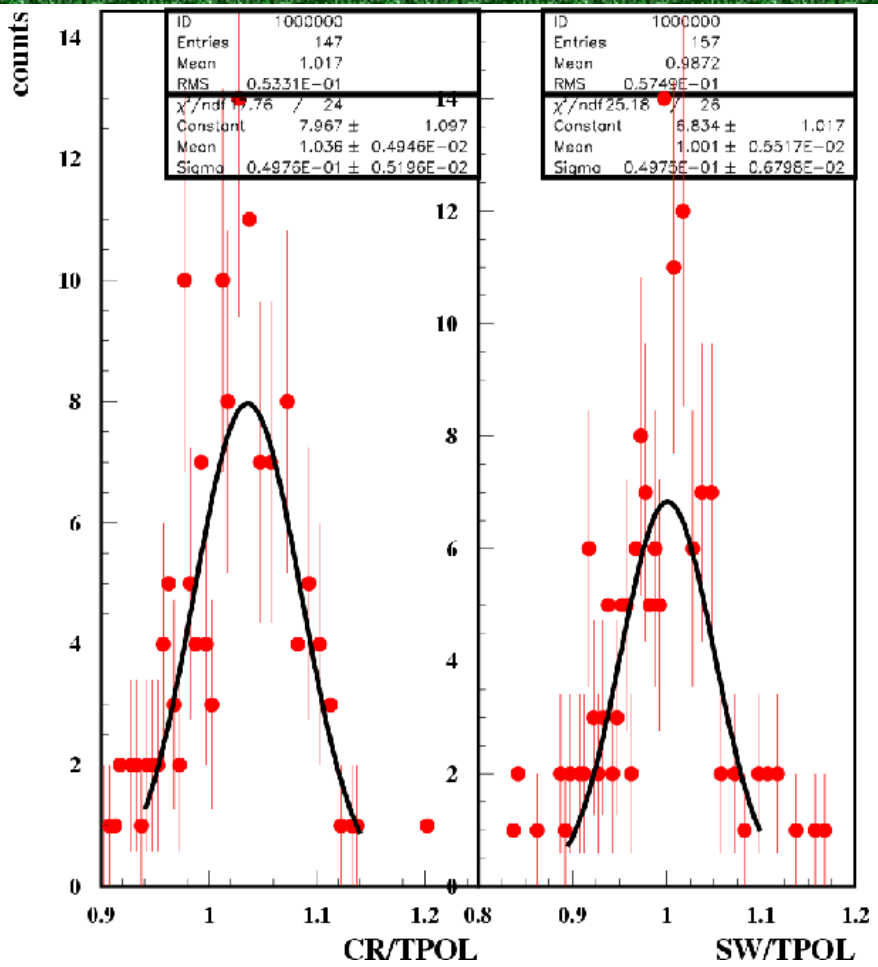
# TPOL

- New offline analysis group (T. Behnke, D. South)
- First official release of GEANT simulation of TPOL
- New tool: TPOL trend panel (S. Schmitt)
  - provides prediction for change in pol. in HERA



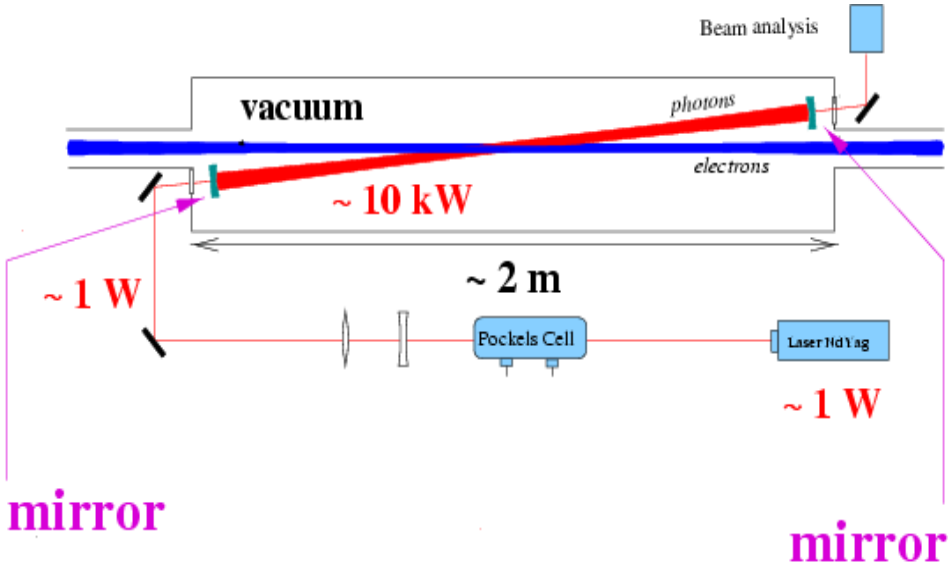
# LPOL

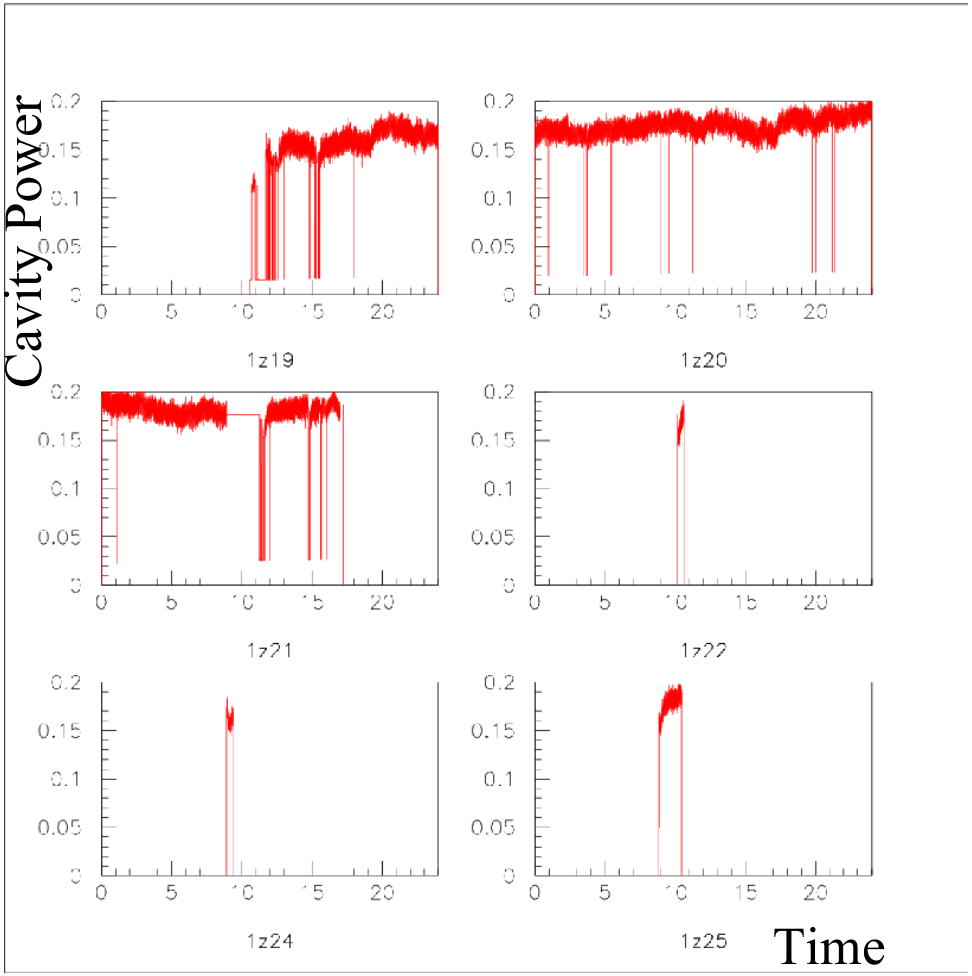



- Damage to both crystal and sandwich calorimeters repaired
- Both consistent to ~3% with TPOL, but further testing in progress
- LPOL fully operational again

# Cavity LPOL



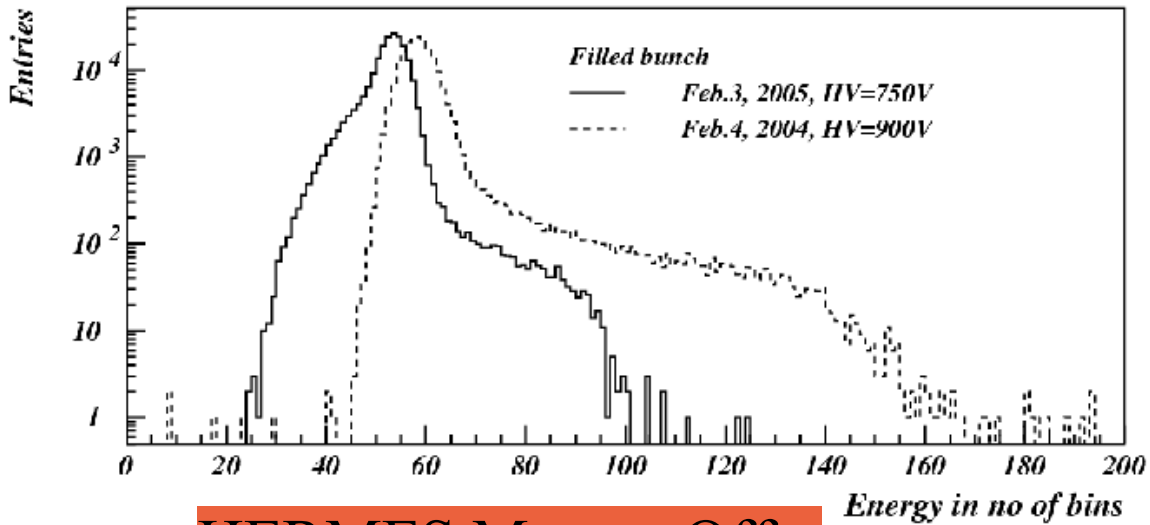




- Recommissioning in progress
- New temperature stabilisation device
  - improved locking of laser cavity
- Locking performed and observed from Orsay
  - automatic control effective

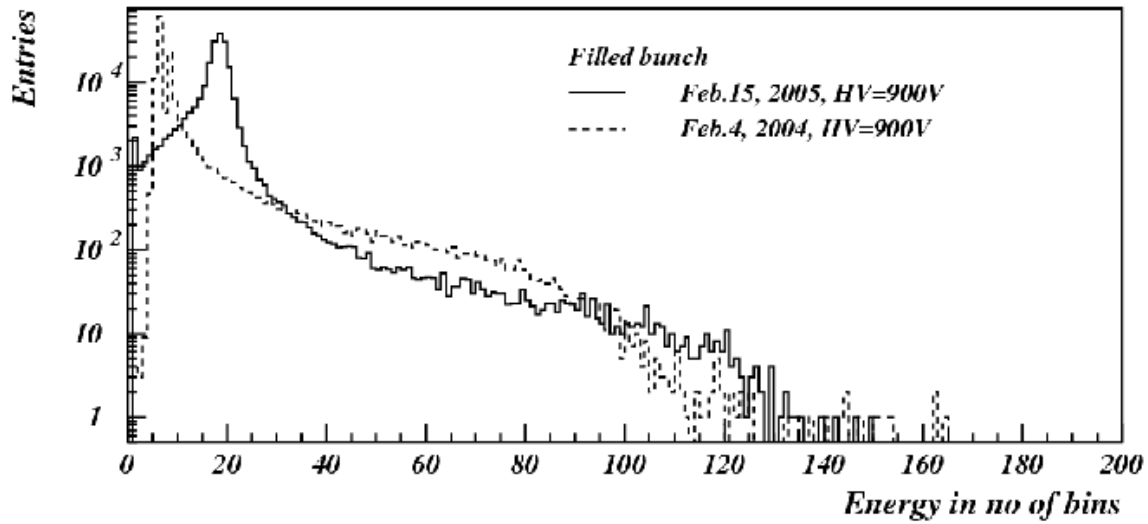
# Cavity LPOL 2

- First new bremsstrahlung spectra taken
- With HERMES target magnet on see large shift
- But also see shift small shift without HERMES magnet

HERMES Magnet On

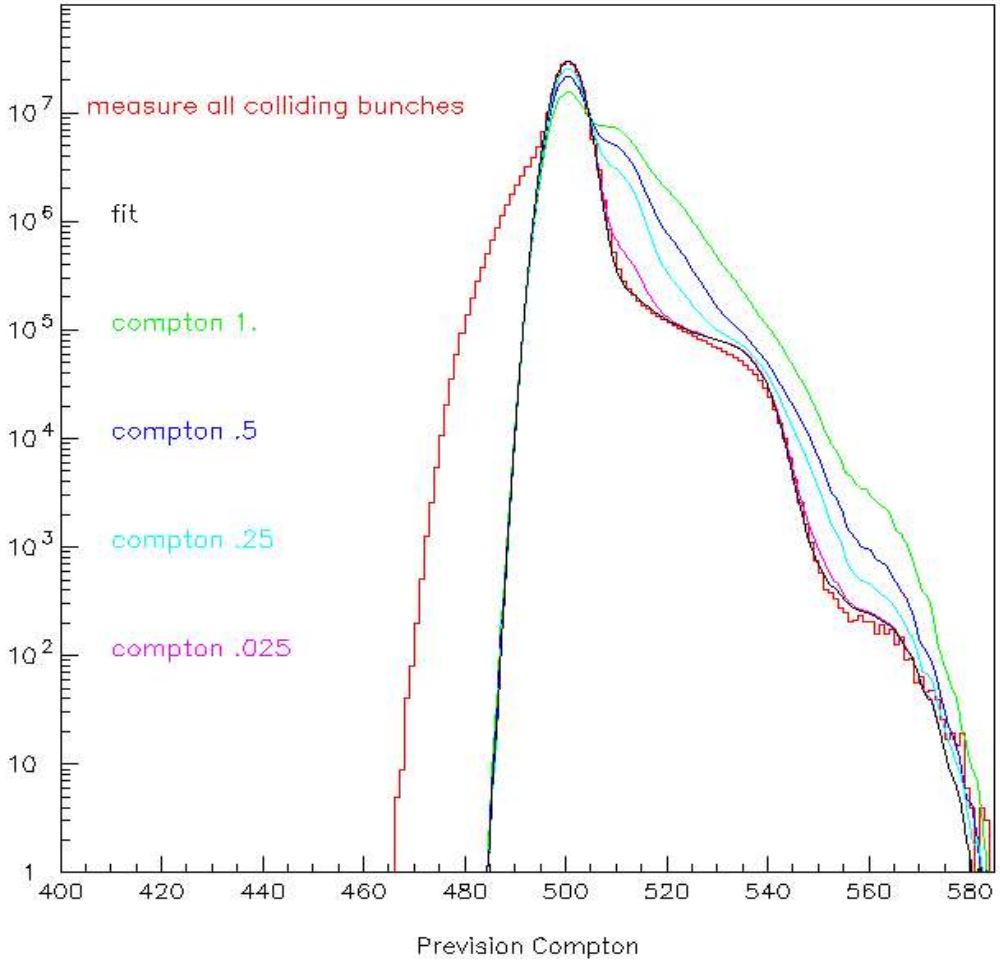



HERMES Magnet Off

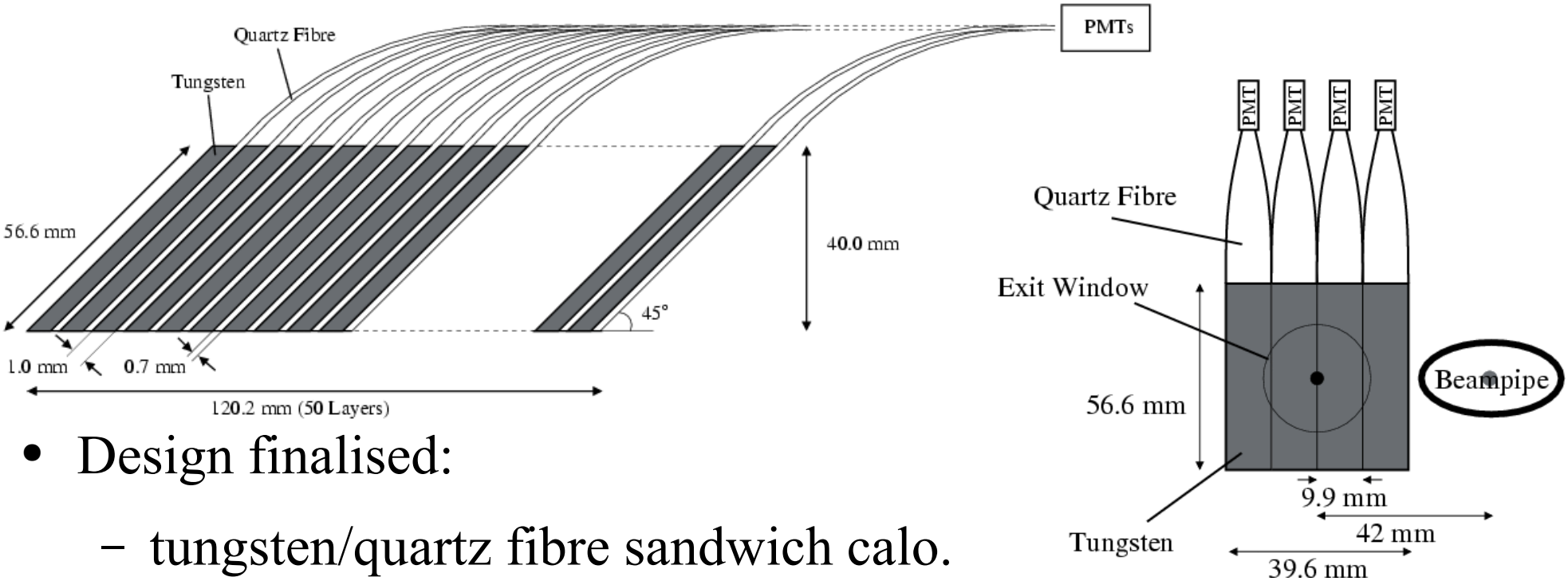


# Cavity LPOL 3

- Can still see Compton photons above bremsstrahlung spectrum
- Plan: start interactions with electron beam
  - close contact with HERA
  - use sandwich calorimeter for time being
  - however can only use for few weeks

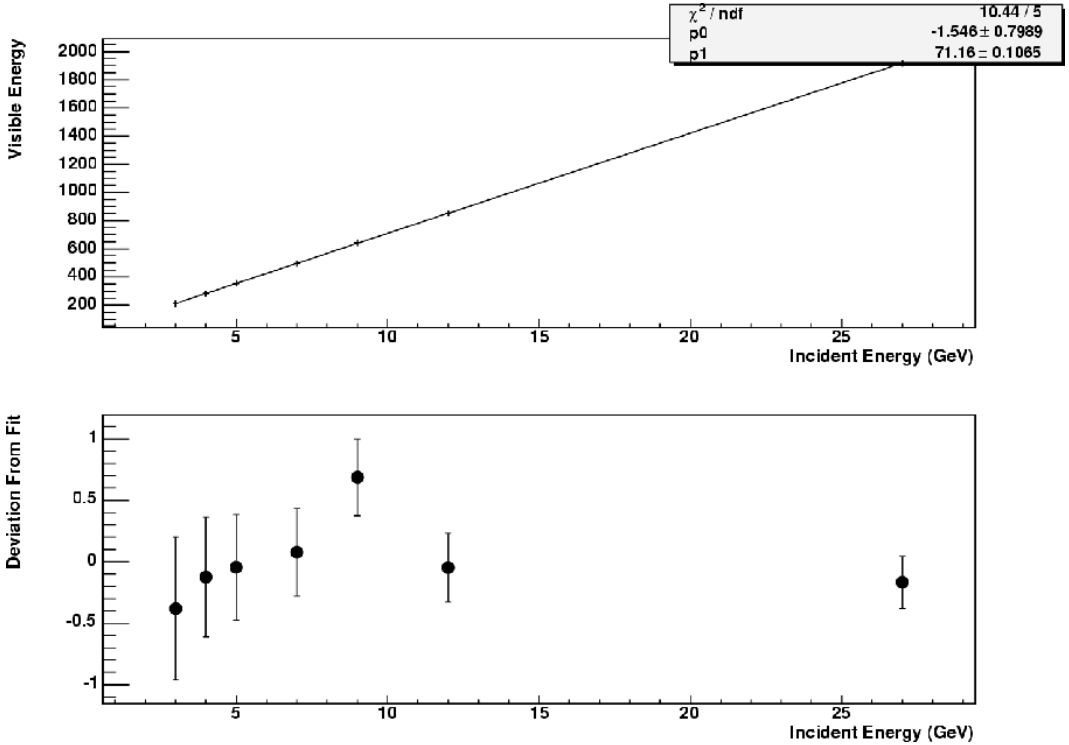


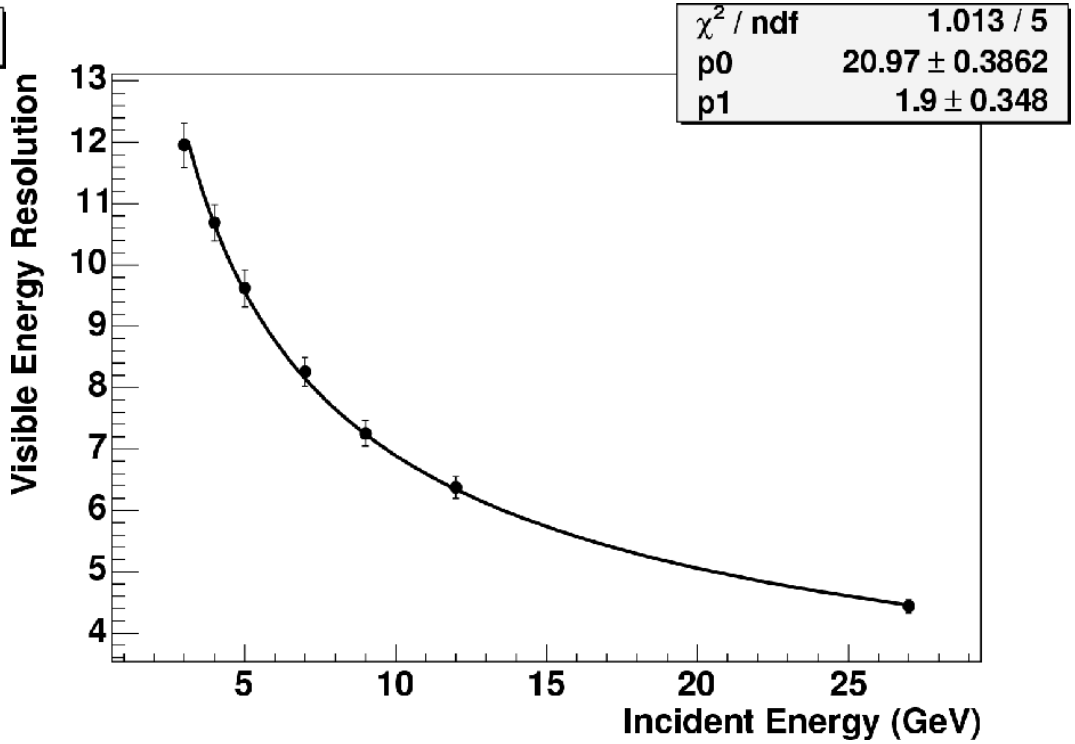
# New Calorimeter




- Design finalised:
  - tungsten/quartz fibre sandwich calo.
  - radiation hard, compact
  - $45^{O}$ tilt to maximise Cherenkov signal
- Full GEANT3 simulation (until end of fibres)
- Note sent to POL2000 group on design

# New Calorimeter 2




- Linear response to < 0.5%
- Resolution within requirements:

  $a = 20.97 \pm 0.38\%$

  $b = 1.9 \pm 0.35\ \%$

- Technical drawings made
- Begin construction on arrival of materials

# Conclusions

- Polarimeters worked reliably
- TPOL focus correction now added to data online
- LPOL calorimeters working well after repairs
- Cavity LPOL recommissioning in progress
  - able to lock cavity reliably for long periods
  - first bremsstrahlung spectra taken
  - hope to begin e beam collisions with laser
- Design for new calorimeter finalised
  - simulation shows properties within requirements