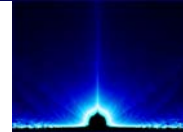


Status of the Longitudinal and Transverse Polarimeters

- **Working polarimeters**

- **HERA polarization status 2005**
- **Efficiency of the polarimeters**



- **TPOL & LPOL**



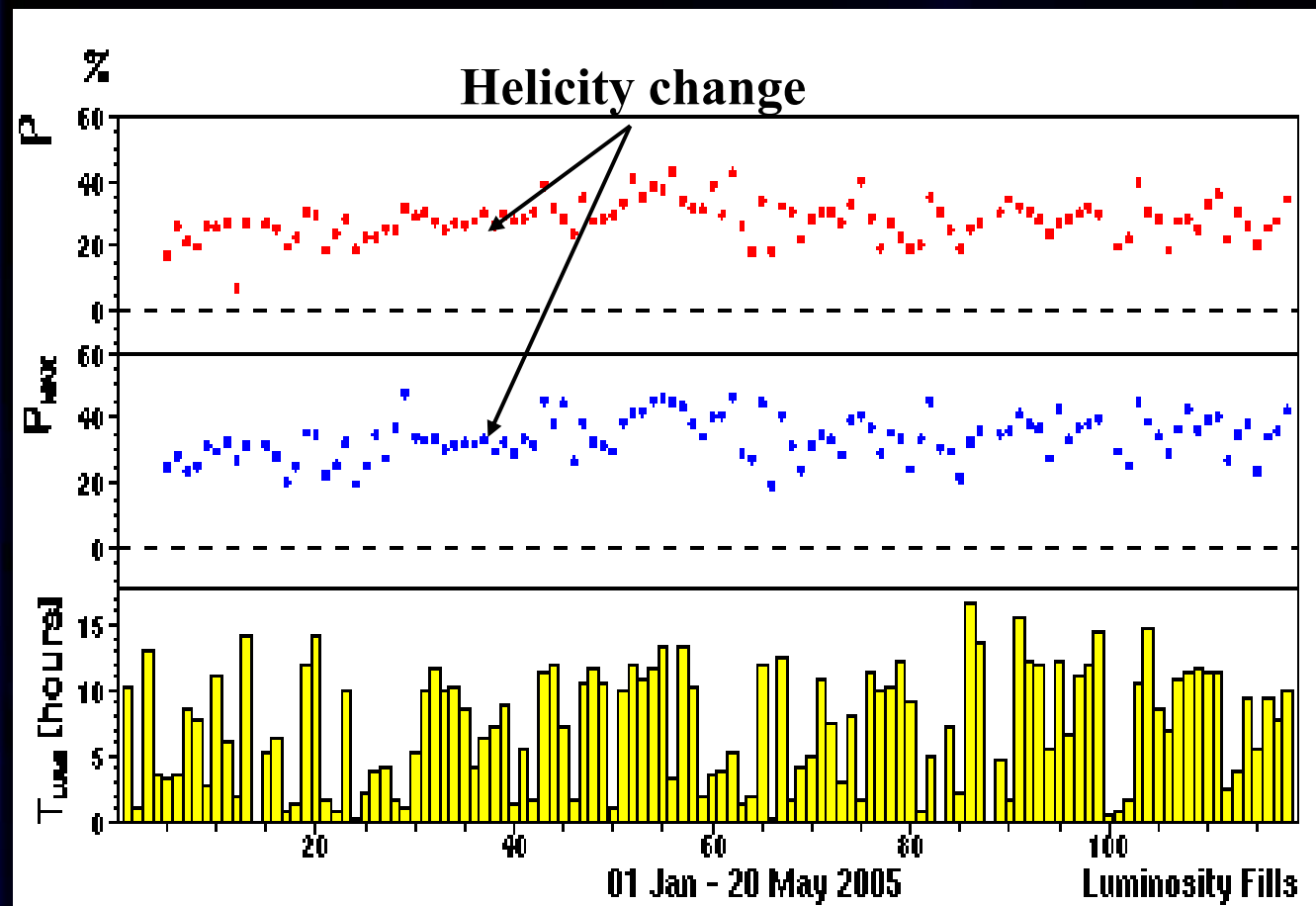
- **Cavity LPOL**

- **Energy spectrum with locked or unlocked cavity**
- **Bremsstrahlung spectra**
- **Present Status**
- **New calorimeter**



WORKING POLARIMETERS

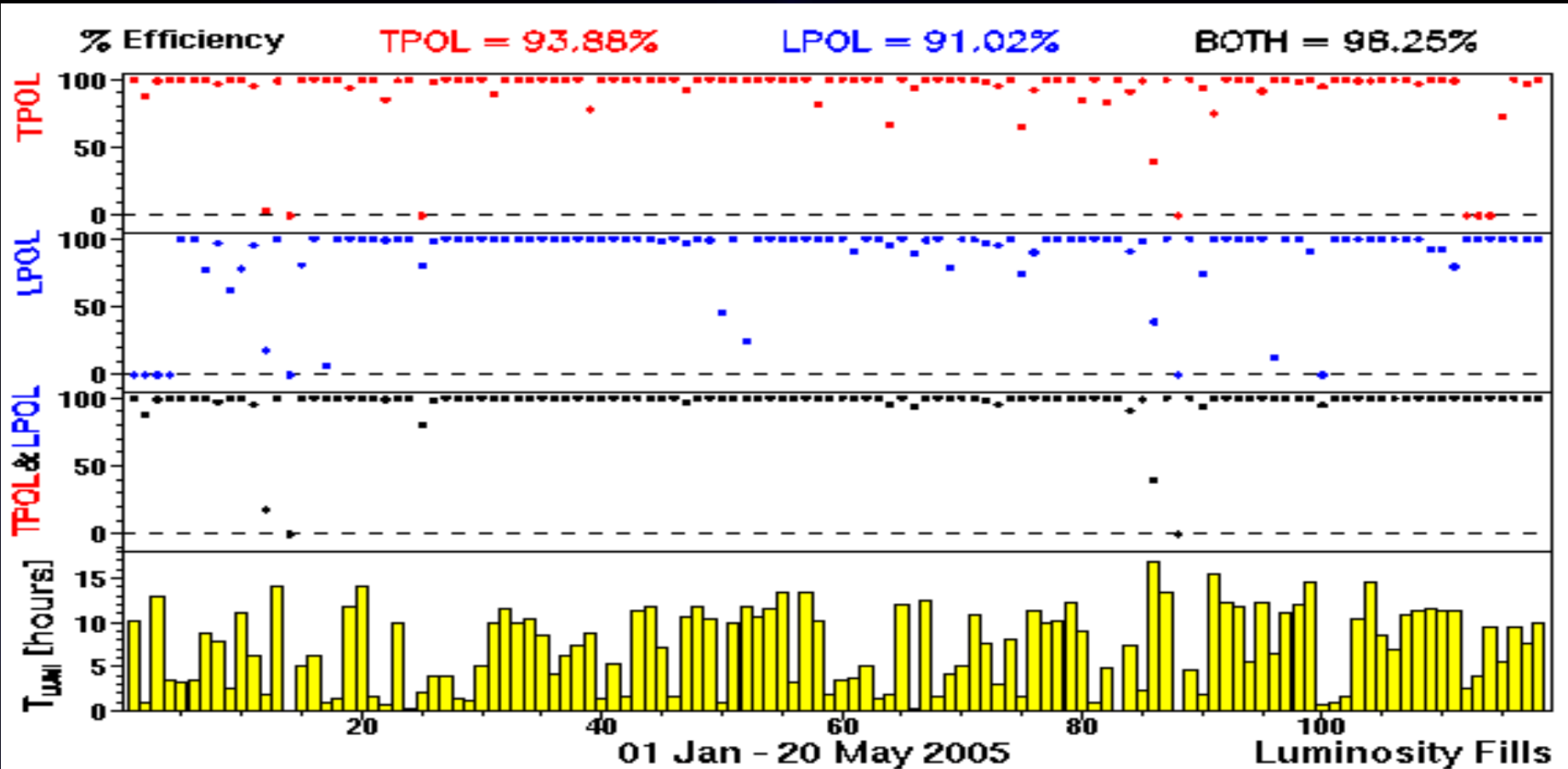
Polarization Delivered in 2005



- Polarisation is rather low (less than 30%) compared to the previous year.
- Polarization do not show a clear tendency.
- Polarization level is not enough for experiments. For ex. HERMES predictions are based on 50%.

Experiments wait that the Polarization level increase

Efficiency of the Polarimeters



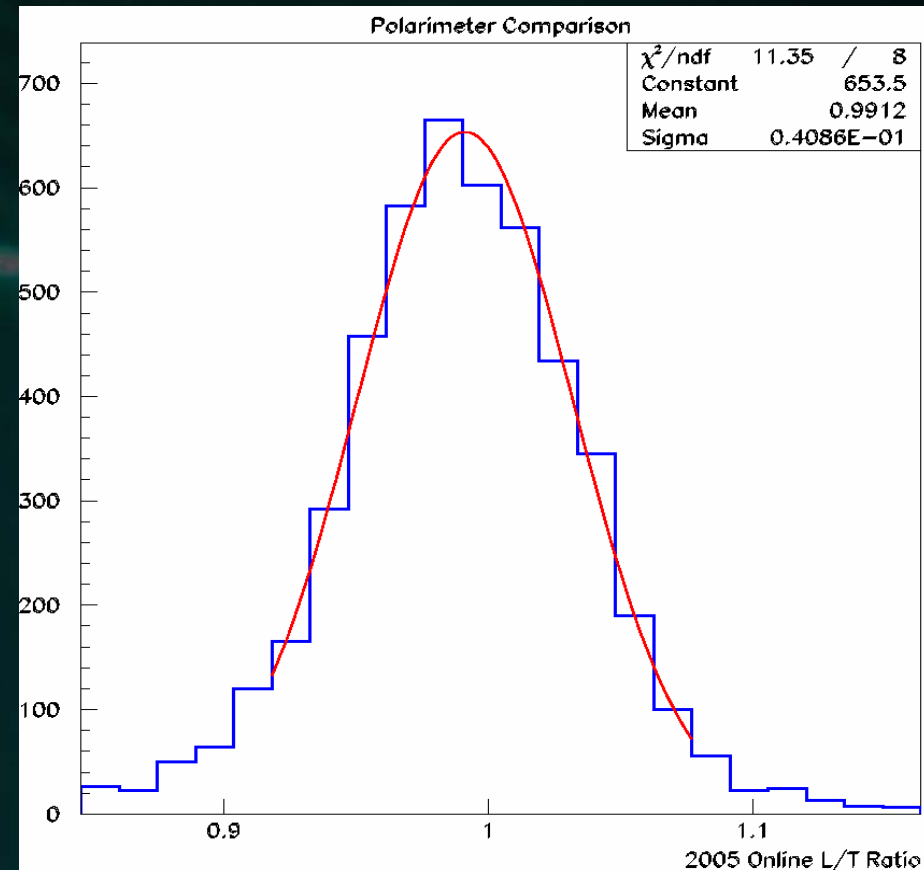
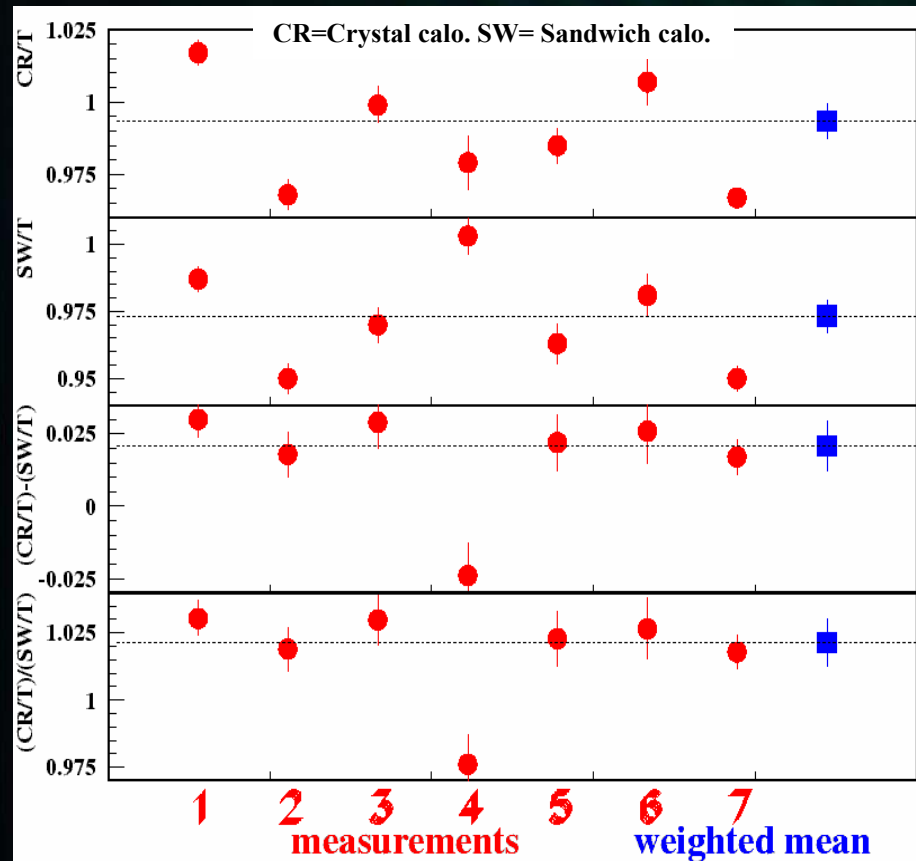
- LPOL: Machine studies (begin of 2005) + Time for syst. studies and Cavity studies
- TPOL: TPOL vacuum window + Hardware electronics.



TPOL ~94% LPOL ~91% Both ~98.25%

LPOL & TPOL

LPOL



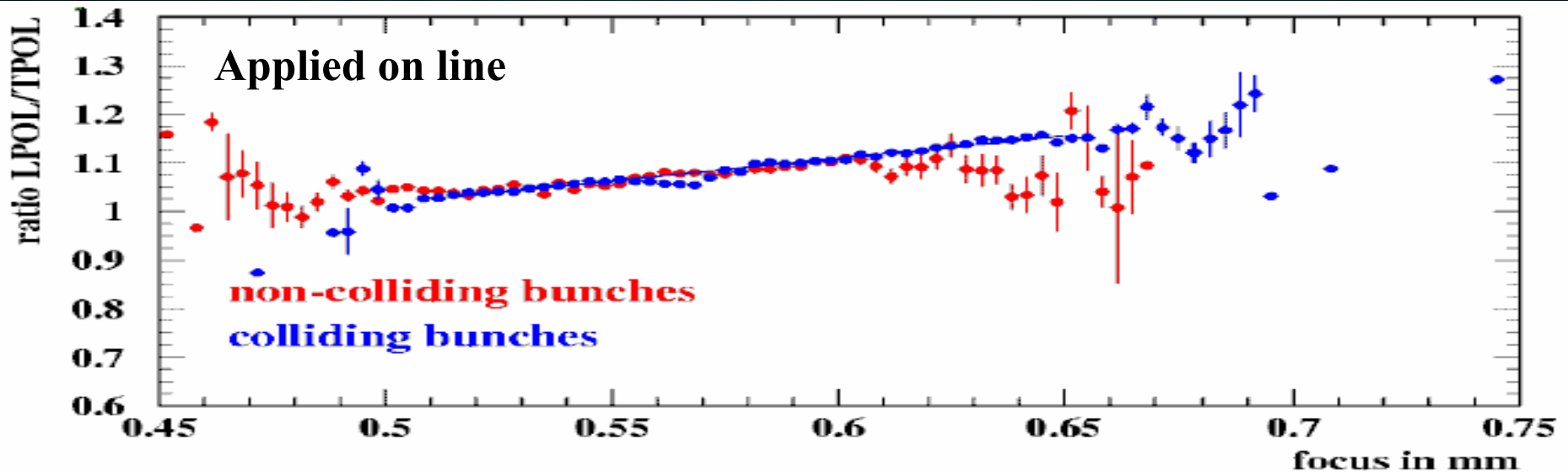
**2% errors between CR and SW.
Detailed systematic studies are
planned to decrease this number.**

**Data from 1st Jan to 20th May show a
clear agreement at online level (no
LPOL data quality corrections)**



Good agreement TPOL-LPOL even at online level

TPOL



There were some changes in 2005 in hardware:

- Stepping motor controller changed.
- Si detector damaged 2 month ago- Debugging in progress.
- Function generator for depol.

Detailed syst. Studies shows beam spot to Polarization correlations.

Monte Carlo simulation confirmed the observation.

Focus correction now applied online to data:

$$P^{Corr} = P_{online} \cdot (1 + 0.6649 \text{mm}^{-1} \cdot (\text{focus} - 0.4436 \text{mm}))$$

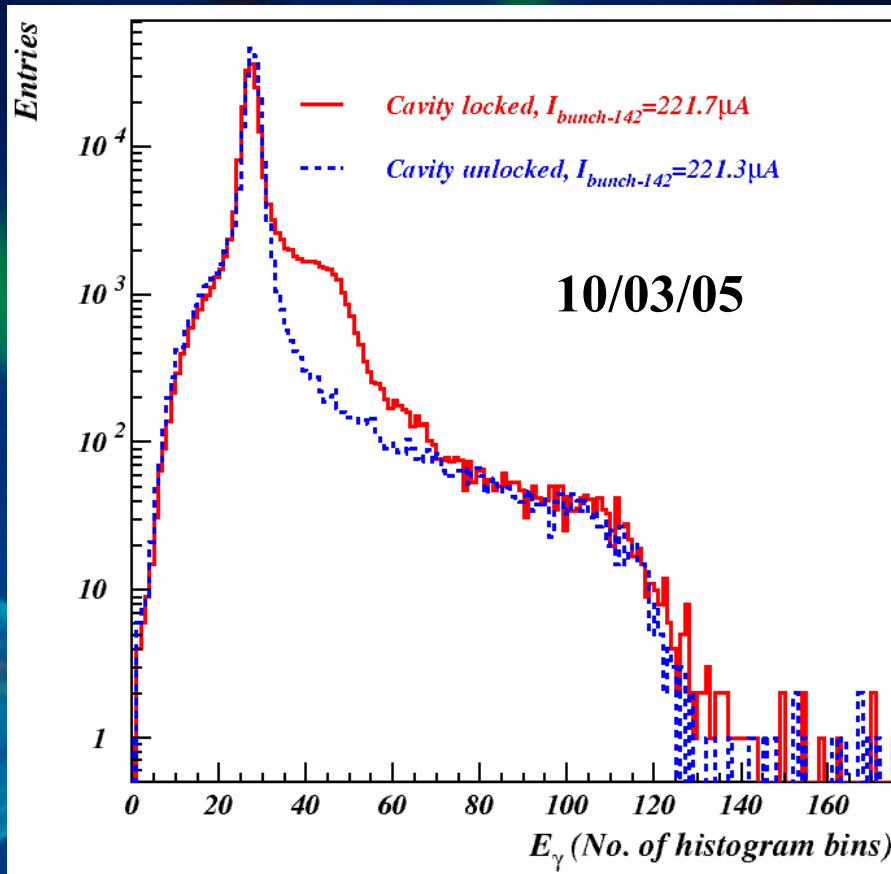
Current TPOL syst. 3.5%





NEW CAVITY LPOL

Energy spectrum with locked or unlocked cavity

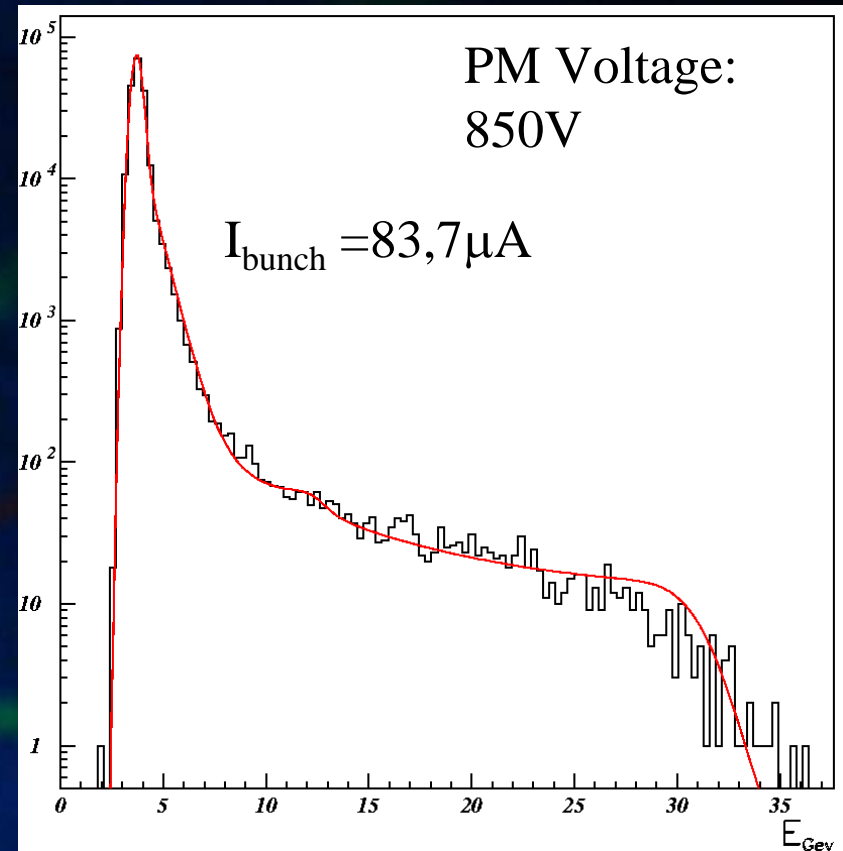
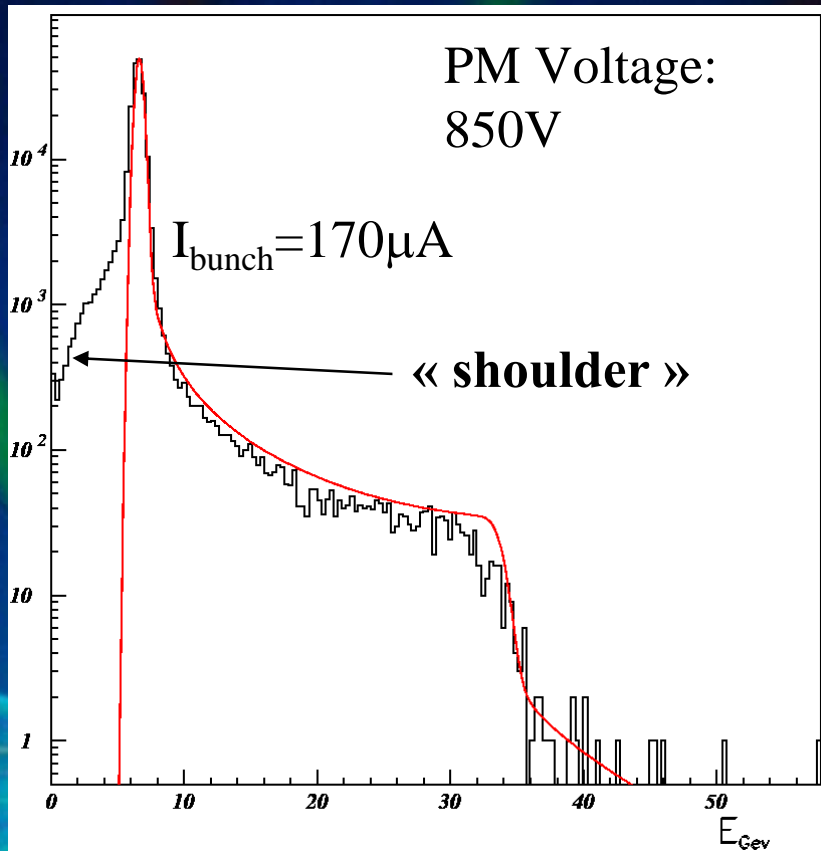


- Histograms show a clear signal of Compton photons above the Bremsstrahlung spectrum.
- Estimation gives a rate of 0.1 photons per bunch crossing



The new Cavity LPOL is recording Comptons event now

Bremsstrahlung Spectra

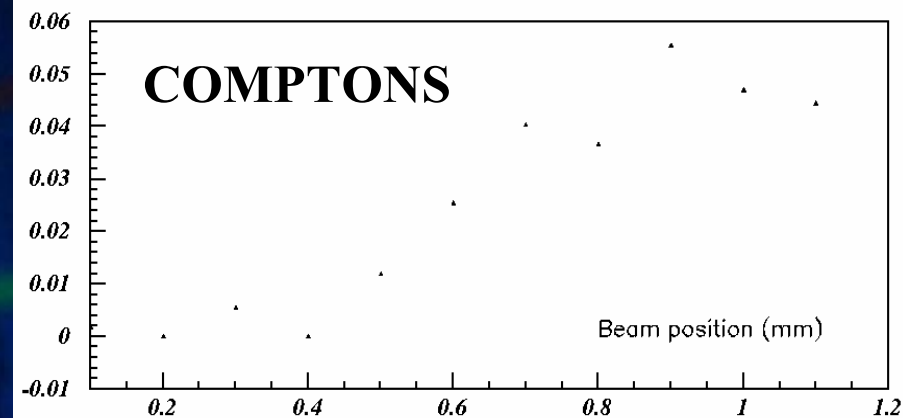
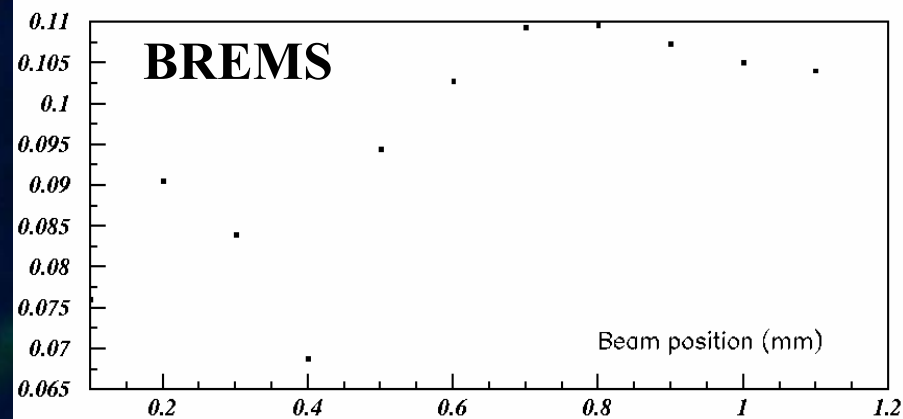
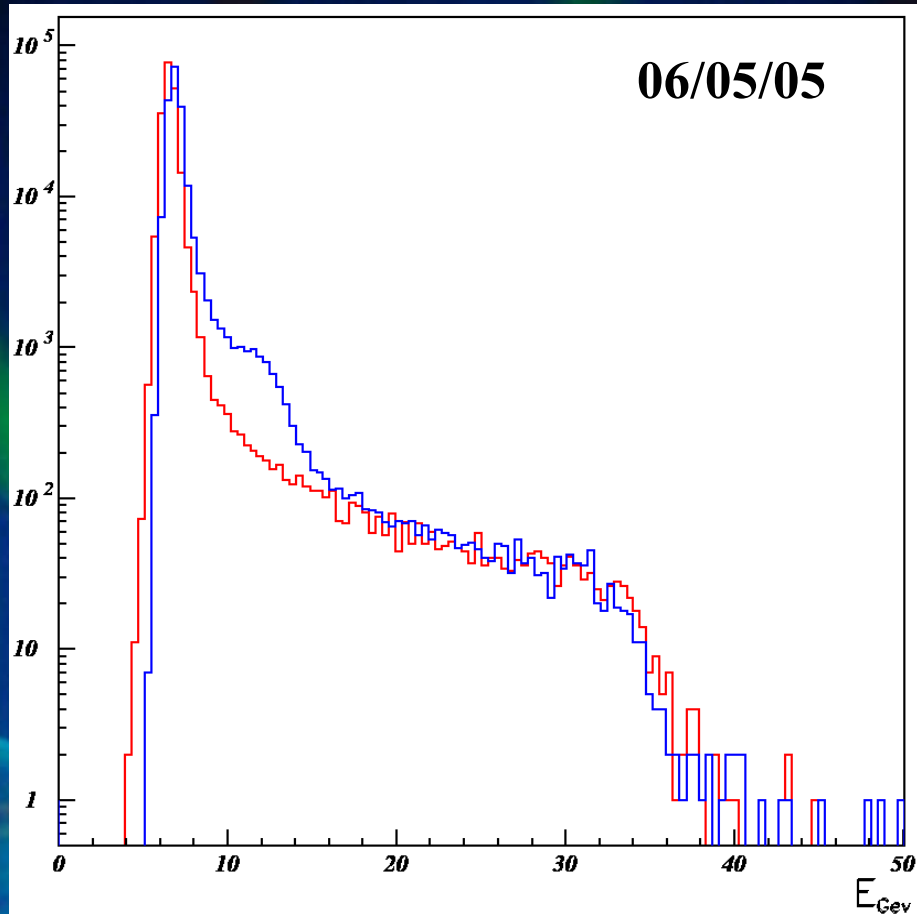


- Synchrotron radiation shift has been reduced by putting a one X0 tungsten plate in front of the calo
- Problems with electronics readout induced a « shoulder », now removed



Brems Spectra is now understood

Present status

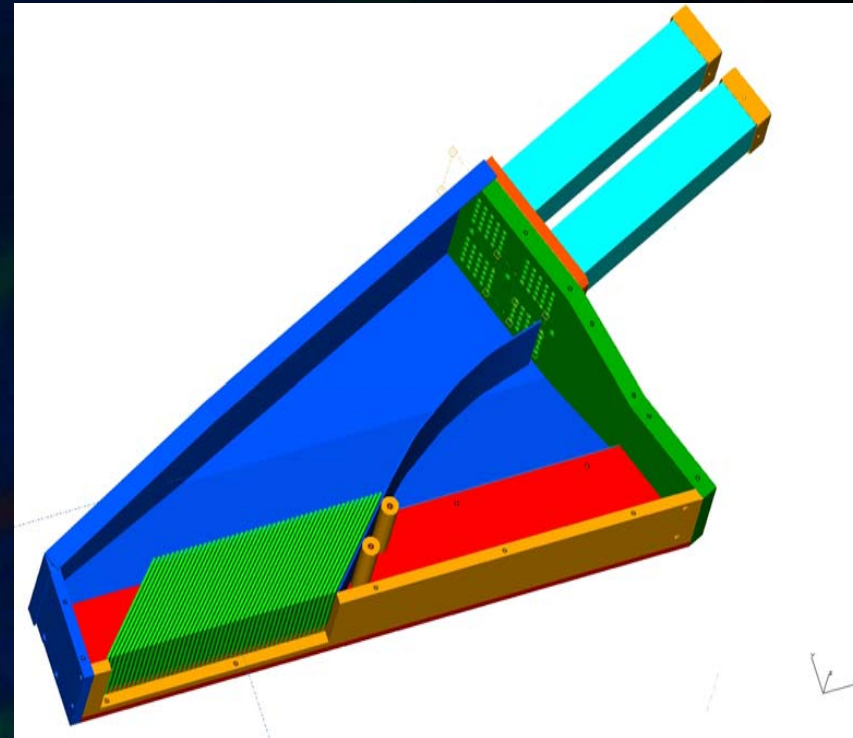
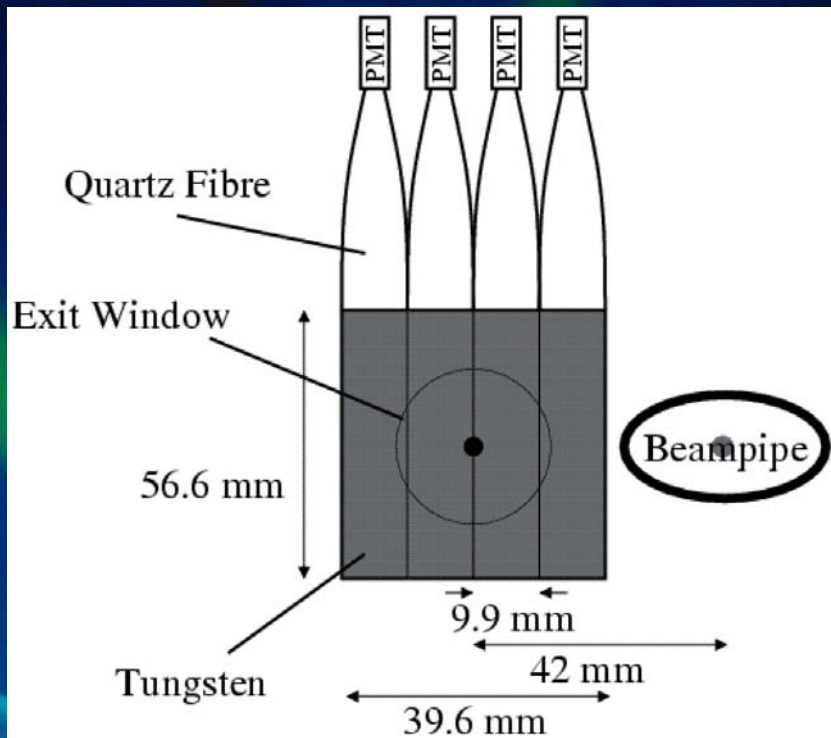


- Locking STABLE under any accelerator conditions.
- Locking STABLE / switch laser pol.

- DAQ problems, under study
- Polarisation estimation almost there.

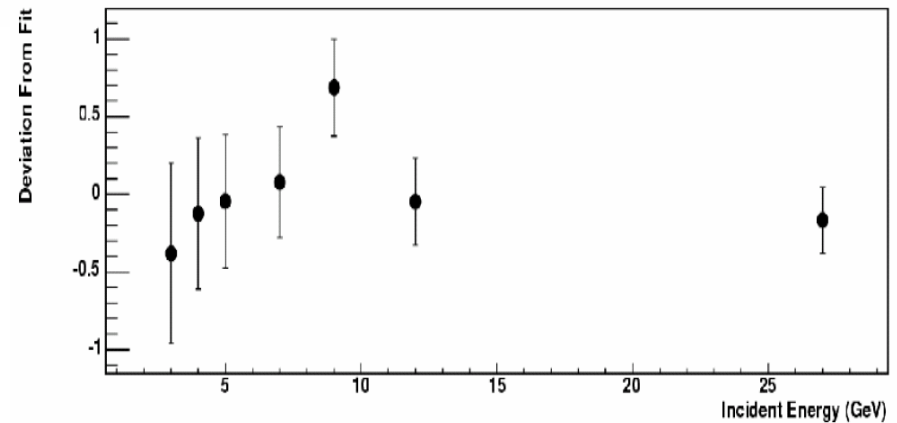
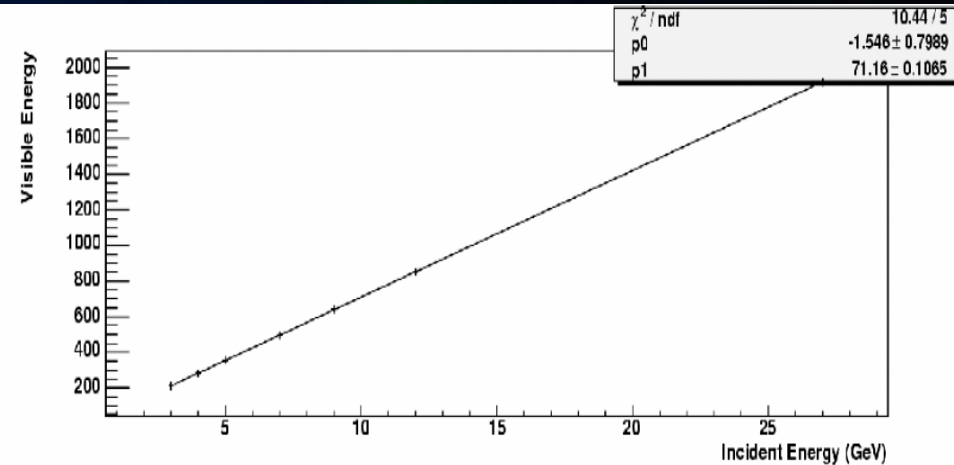
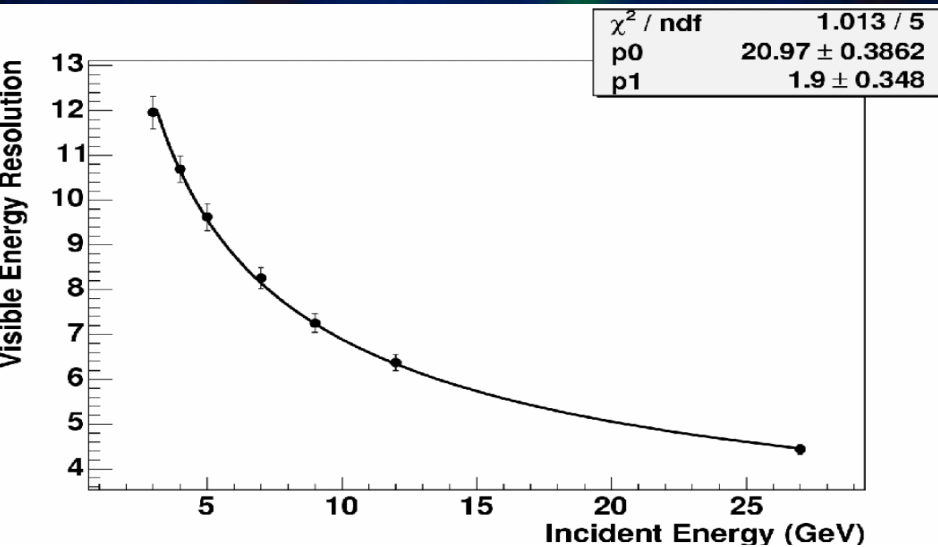
Cavity LPOL is on the way to deliver polarisation

New Calorimeter



- Neither of the 2 LPOL calo are suitable for cavity operations.
- Tungsten- Quartz fiber sampling calorimeter.
- Signal produced from \checkmark radiation in the quartz fiber.
- 50 layers of tungsten plate interleaved with layers of quartz fiber

New Calorimeter



- Design and complete simulation of Č light done
- Energy resolution within the requirements
- To do: Cut the fibers & bundle them.

Will be finished by end of June, take into operation as soon as possible

Conclusions

- **Working polarimeters:**
 - **In 2005 Efficiency for the LPOL is ~ 91% and TPOL ~ 94%, combined 98.3%**
 - **TPOL & LPOL:**
 - **Polarimeters in agreement within systematics**
- **Cavity LPOL:**
 - **Procedure for Laser/e-beam interaction now established**
 - **Brems. spectrum is understood. DAQ problems are under studies.**
 - **New**