PMT CALIBRATION

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- Rich prototype calibration
  - Pedestal calibration
  - High Gain determination
  - High Gain Stability
  - Low Gain determination
- Velocity reconstruction (first results)

Reminder

- 12 pedestal files (11 used)

Pedestal files	N events	comments
1000	2000	
501	4000	
524	6000	
528	4000	
536	7000	
558	800	LIGHT
577	2000	
596	2000	
605	7000	
610	3000	
629	3000	
634	35000	

- 8 led files (6 used)

LED files	N events	comments
1001	7000	RAW
502	90000	RED
537	100000	RED
559	95000	RED
597	90000	Too much light
598	10000	Less events
611	25000	RAW
635	10000	RAW

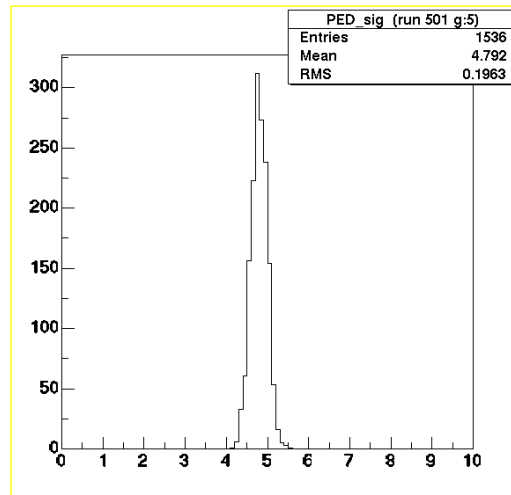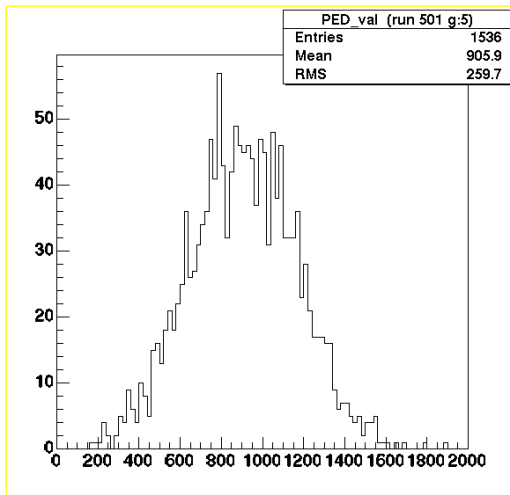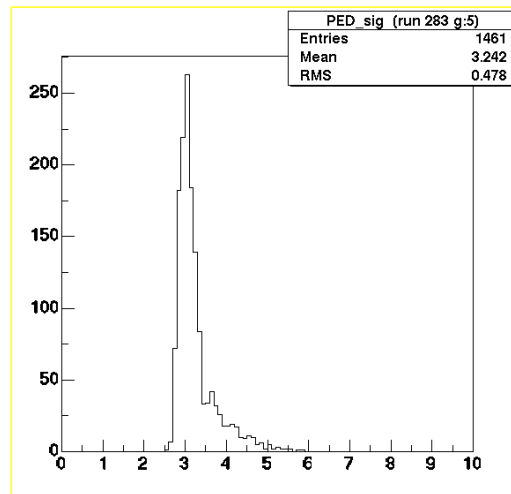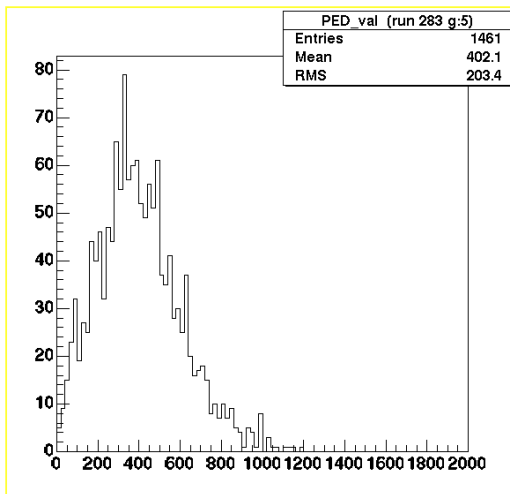# Pedestal Calibration (Low Gain)

- TB-2003
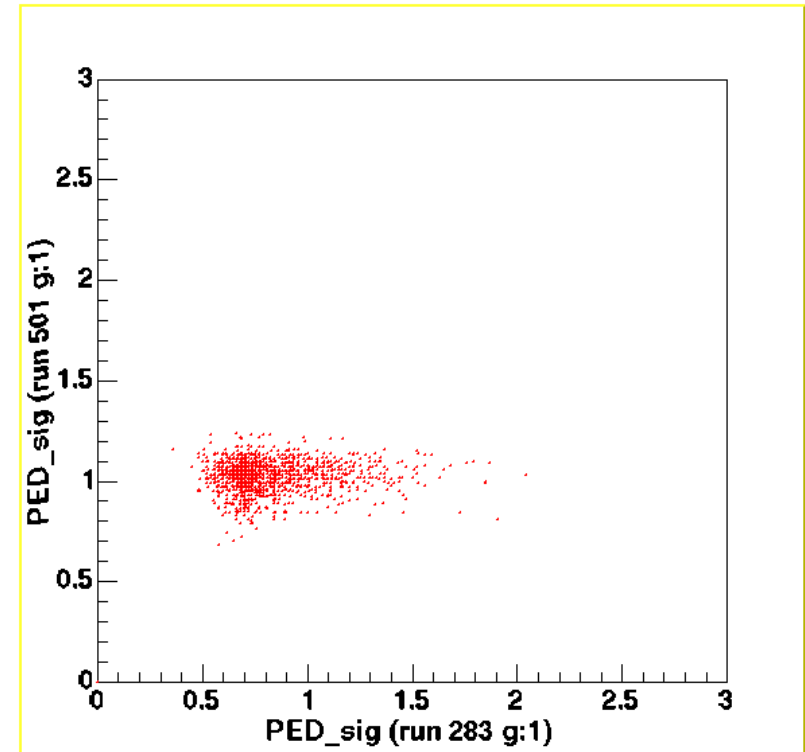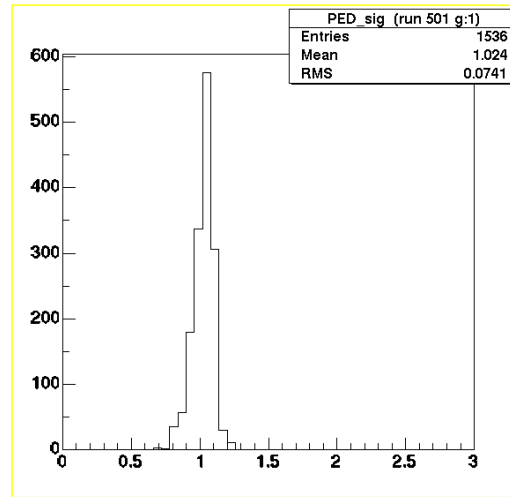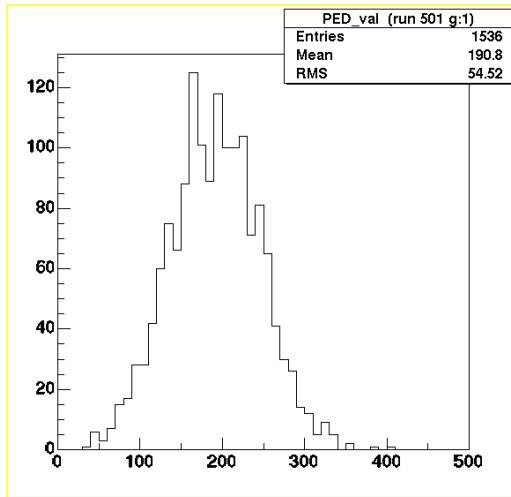
- TB-2002

- 2003 compared with 2002:
  - ➤ Pedestal values shifted to higher values
  - ➤ Higher s

Pedestal Calibration (High Gain)

- **TB-2003**

PED_val (run 501 g:5)	
Entries	1536
Mean	905.9
RMS	259.7

PED_sig (run 501 g:5)	
Entries	1536
Mean	4.792
RMS	0.1963

- **TB-2002**

PED_val (run 283 g:5)	
Entries	1461
Mean	402.1
RMS	203.4

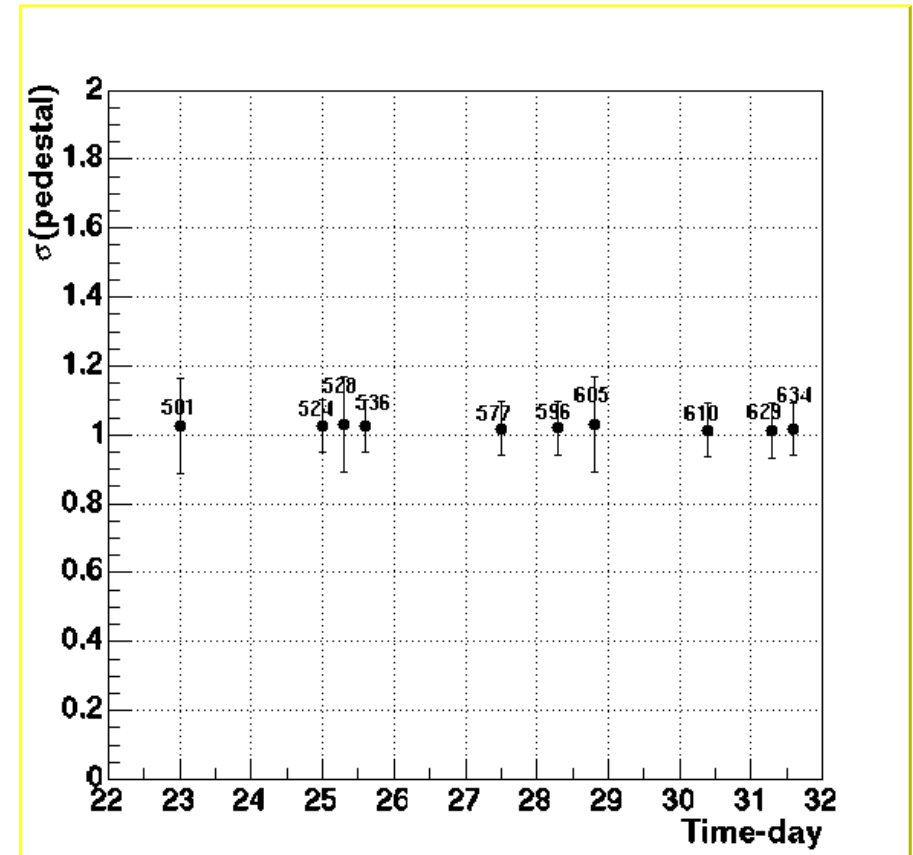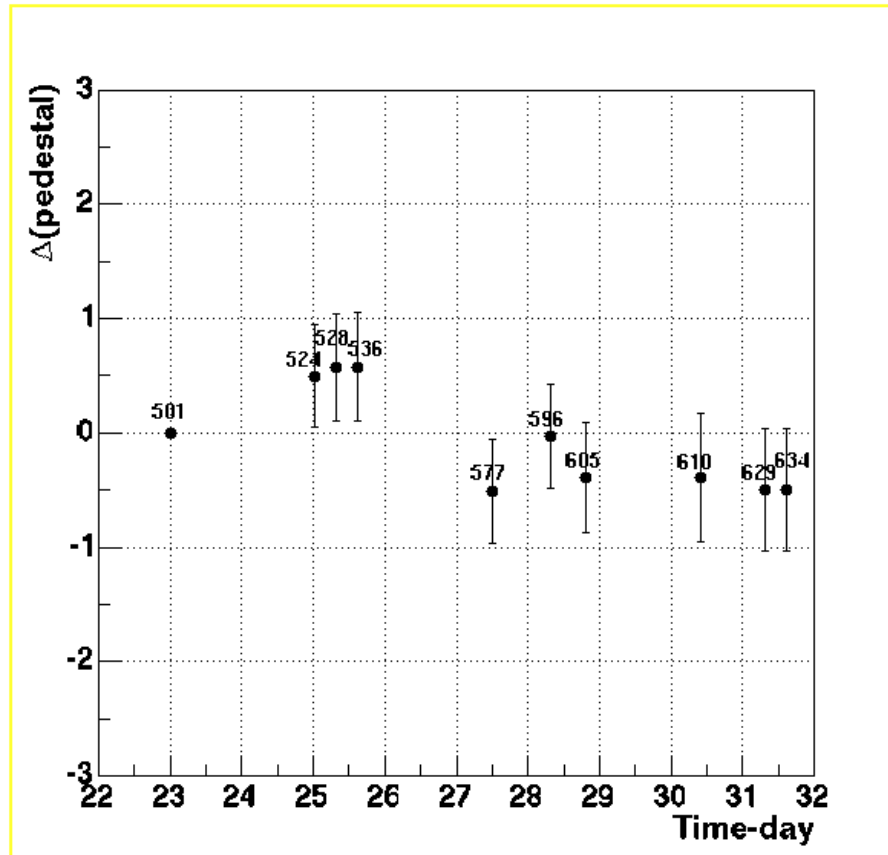| PED_sig (run 283 g:5)	
Entries	1461
Mean	3.242
RMS	0.478

- **2003 compared with 2002:**

  ➤ Pedestal values shifted to higher values

  ➤ Higher s

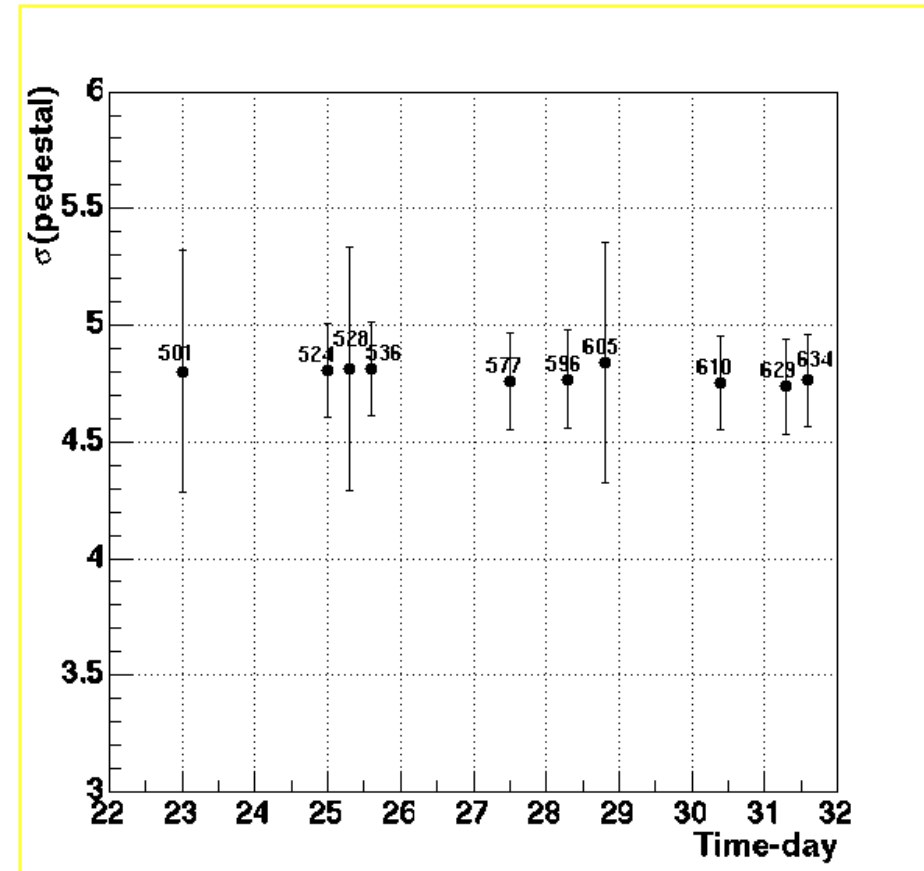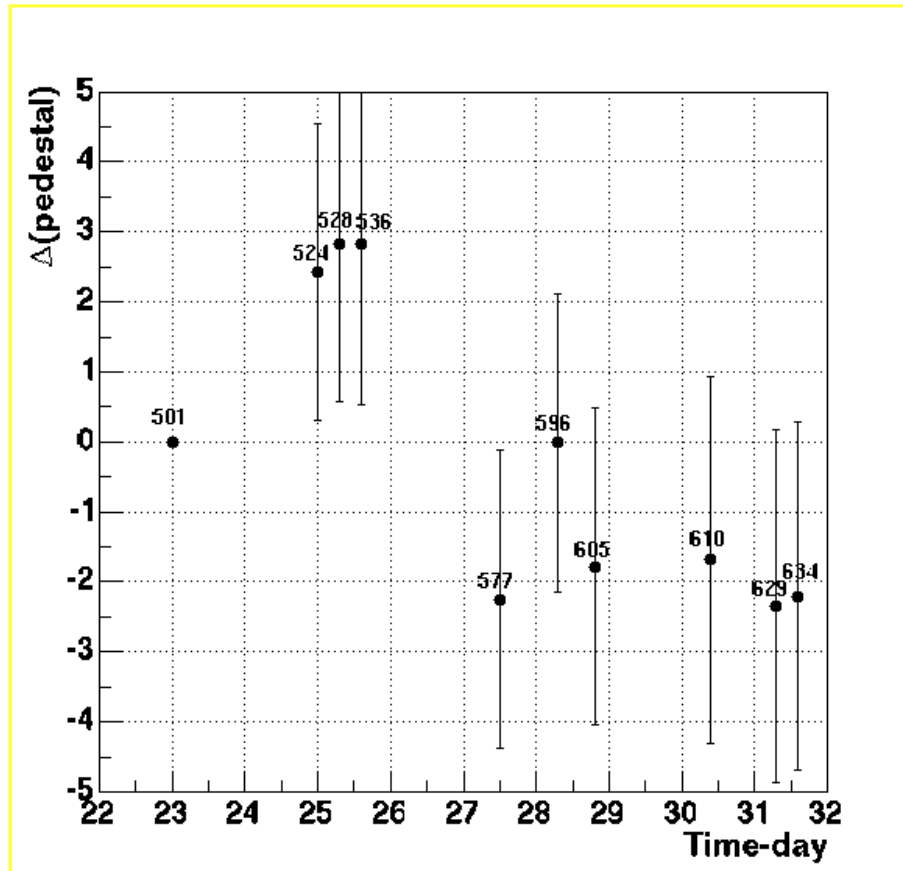# Pedestal stability (TB-2003 Low Gain)

- Time evolution of the pedestal value

- Time evolution of the pedestal width

➢ Channels of the first kapton have been removed from the pedestal distribution

Pedestal Stability (TB-2003 High Gain)

- Time evolution of the pedestal value
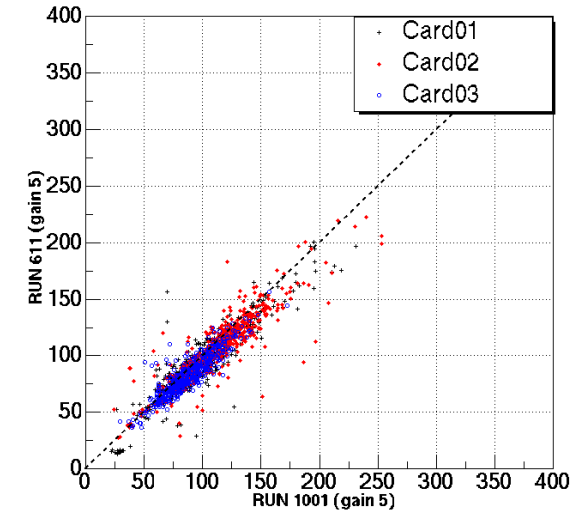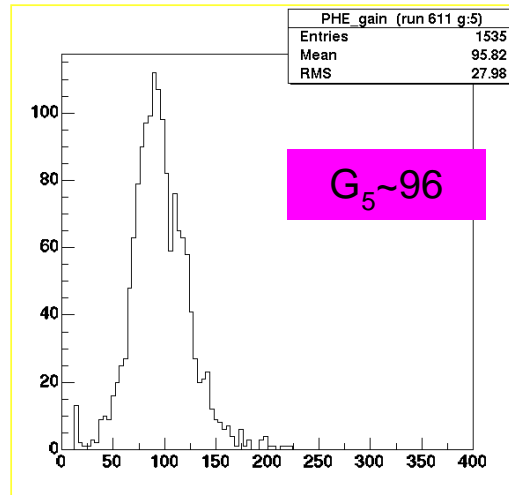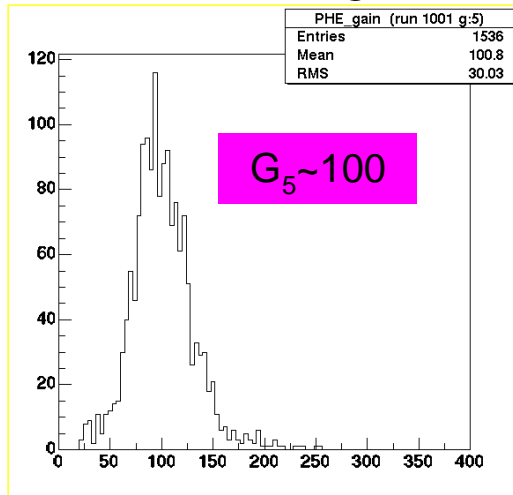- Time evolution of the pedestal width

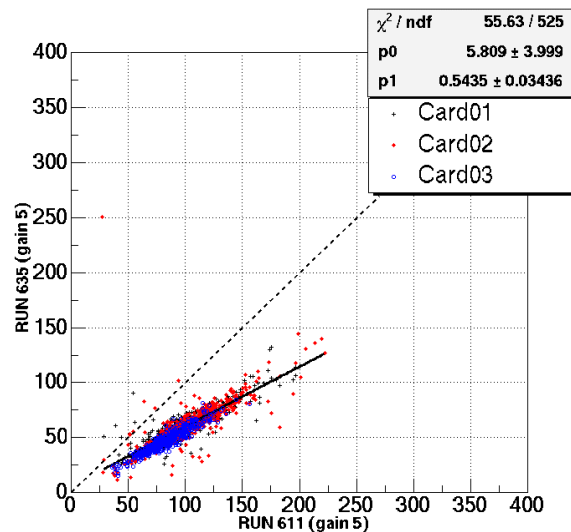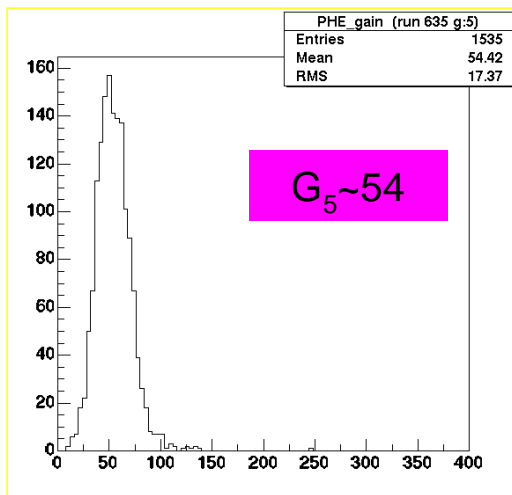➤ Channels of the first kapton have been removed from the pedestal distribution

High Gain Determination
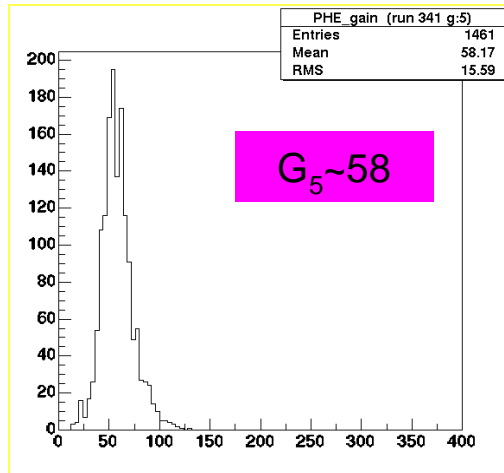
- ## LED RAW (TB-2003)

  - ➤ nominal high voltage

$G_5 \sim 100$

$G_5 \sim 96$
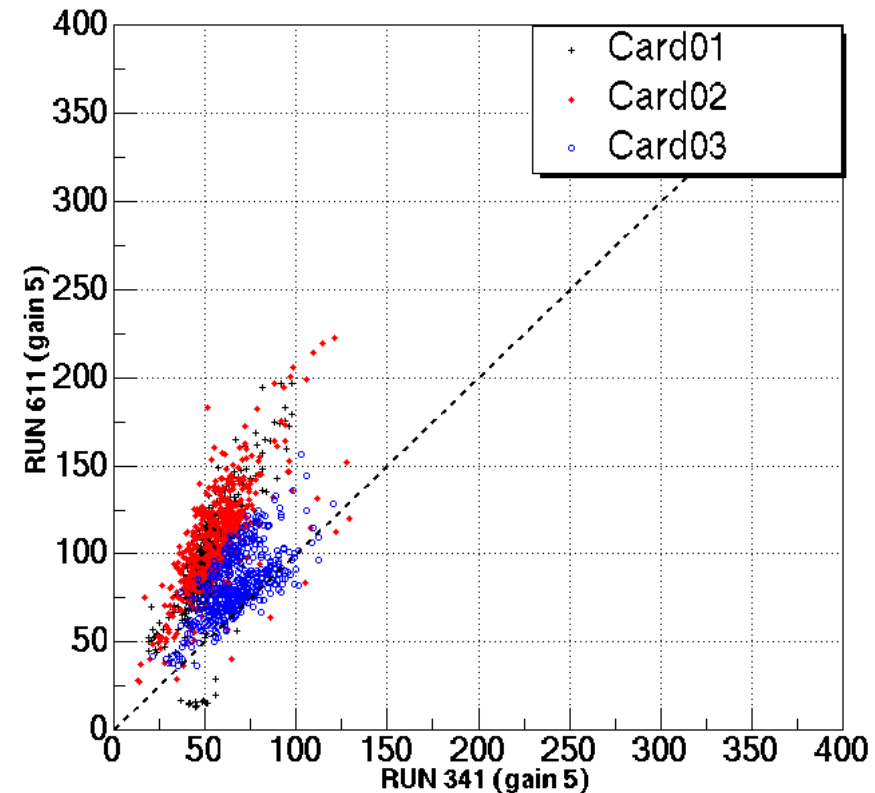
  - ➤ $HV = HV_{nom} - 50\ V$

$G_5 \sim 54$

  - ➤ Gain 5: measurements

    well correlated each others

High Gain Determination (2002 vs 2003)

- **TB-2002**

$G_5 \sim 58$

- **TB-2003**

$G_5 \sim 96$
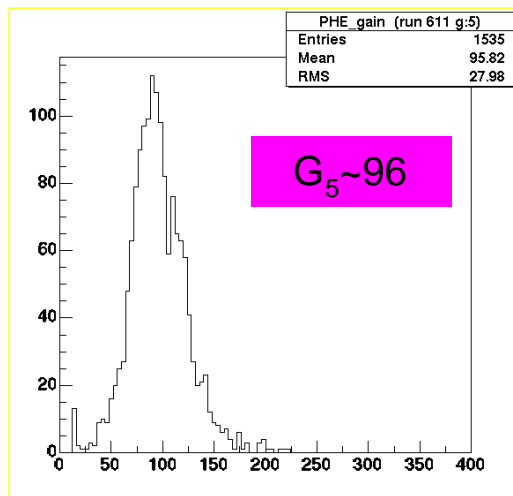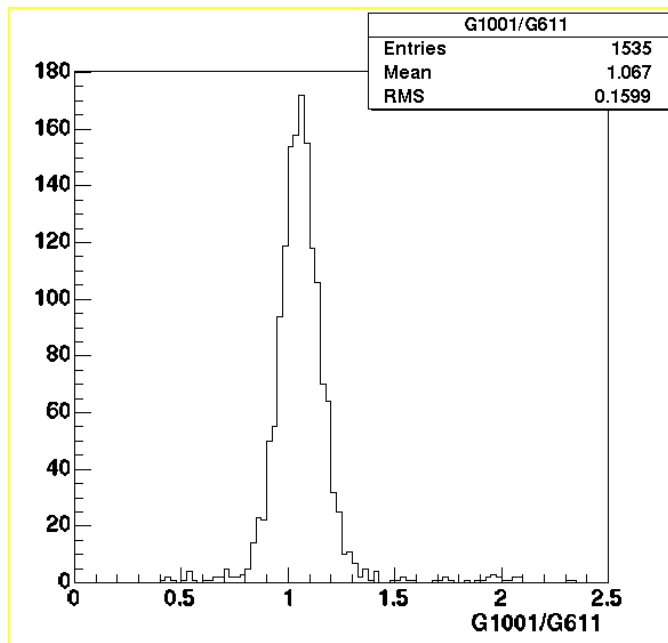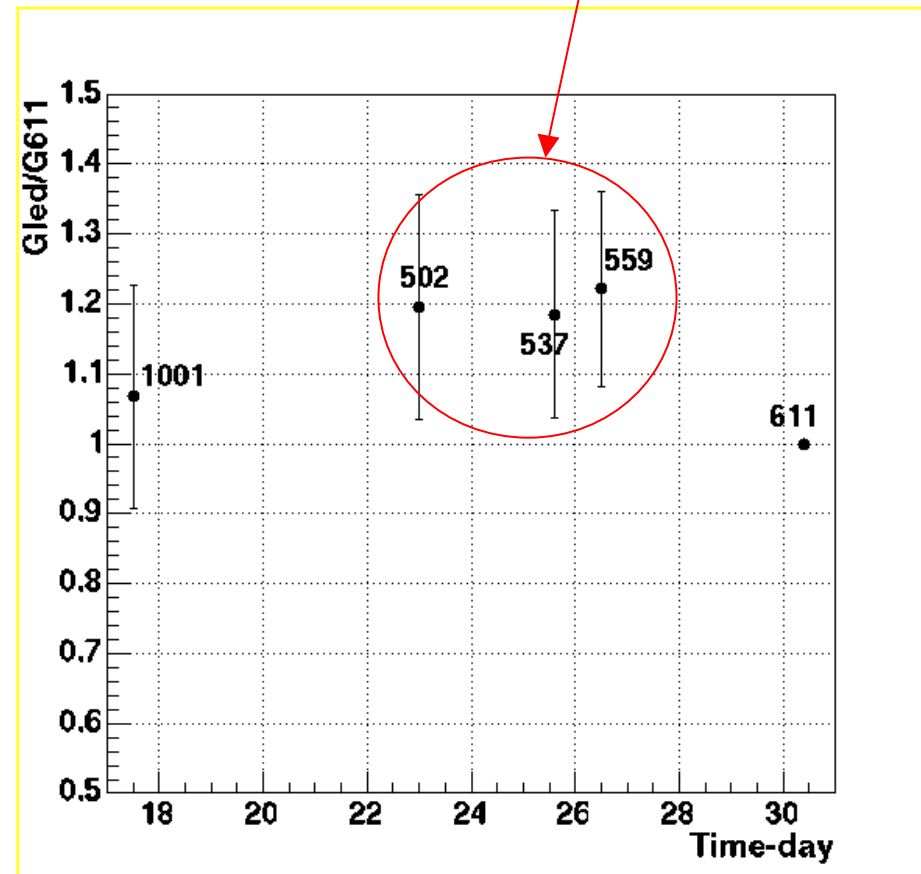

➤ Same HV values applied on the pmt

➤ New readout electronics

➤ Peaking time well adjusted

High Gain Stability

- 2 led run recorded in raw mode and with the same HV (1001-611)
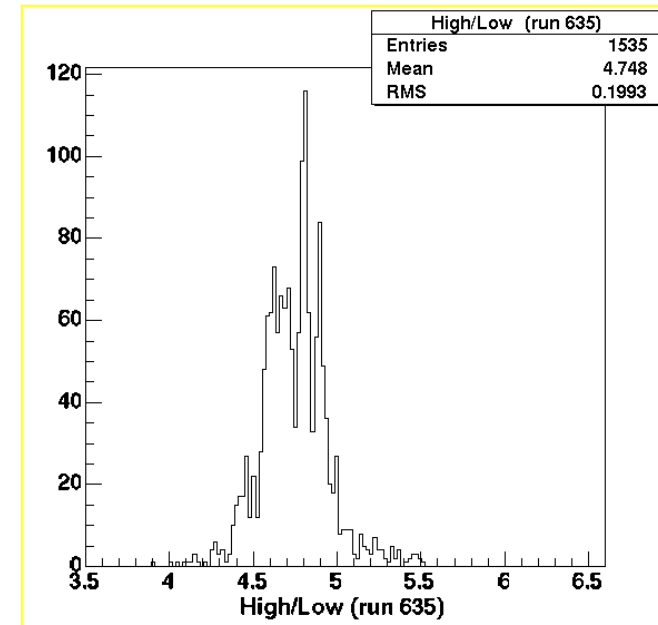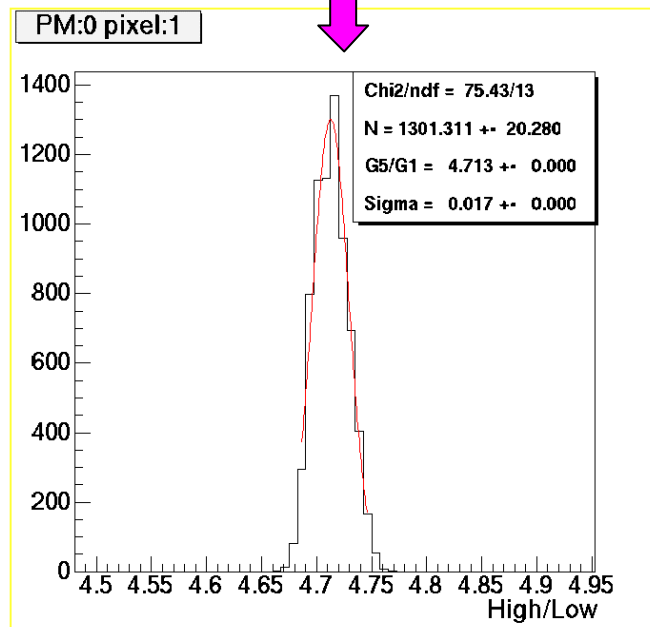
- 3 led run recorded in red mode (502-537-559)

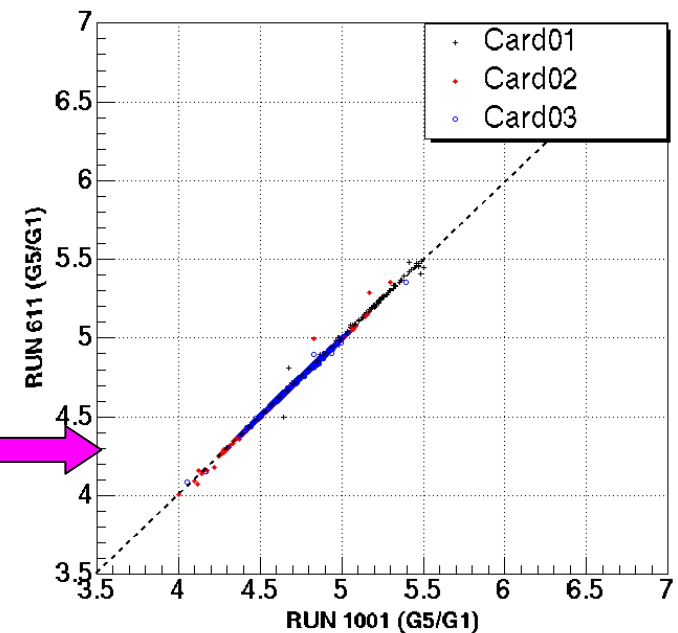➢ Fit in red mode can induce a systematic bias but a small intrinsic error

Low Gain Determination: g_5/g_1 ratio

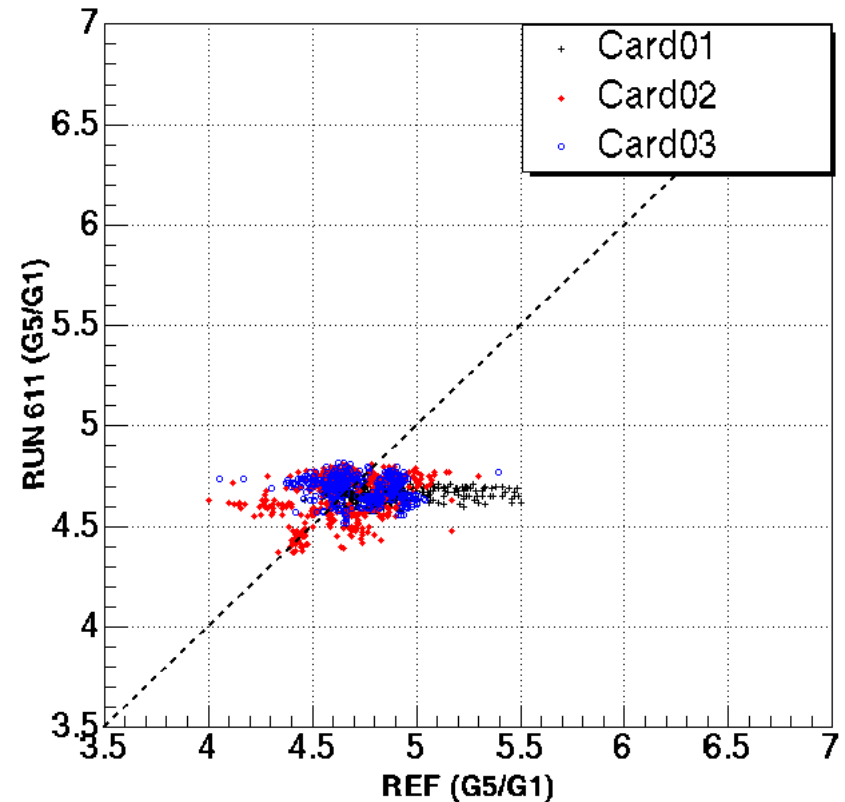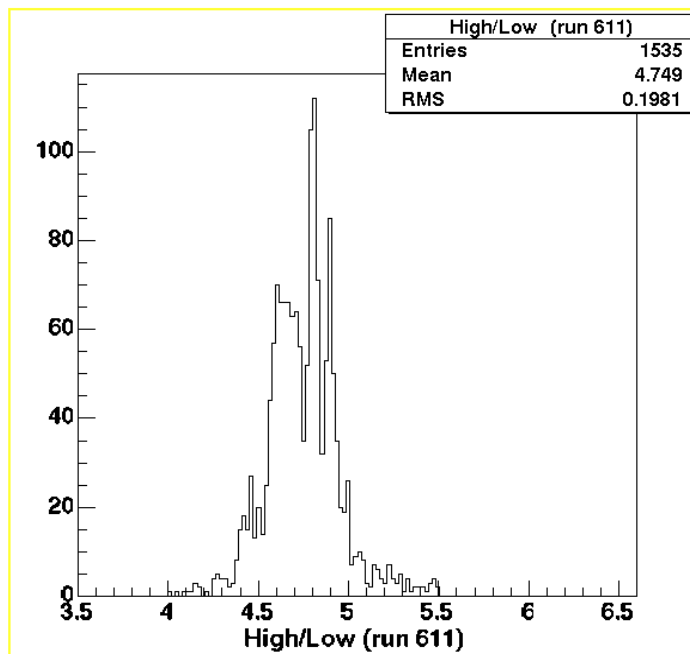- Gain5/Gain1 determined for a given pixel, event by event:

Adc(High)/Adc(Low)

PM:0 pixel:1

Chi2/ndf = 75.43/13

N = 1301.311 +- 20.280

G5/G1 = 4.713 +- 0.000

Sigma = 0.017 +- 0.000

High/Low

High/Low (run 635)	
Entries	1535
Mean	4.748
RMS	0.1993

High/Low (run 635)

- Good correlation between each led run (raw mode)

Card01
Card02
Card03
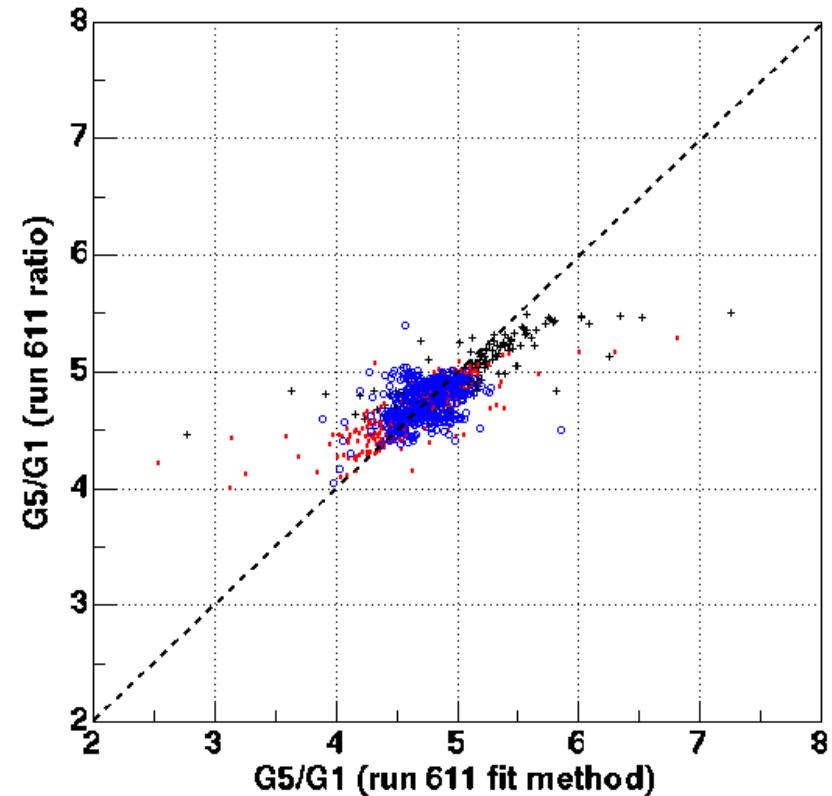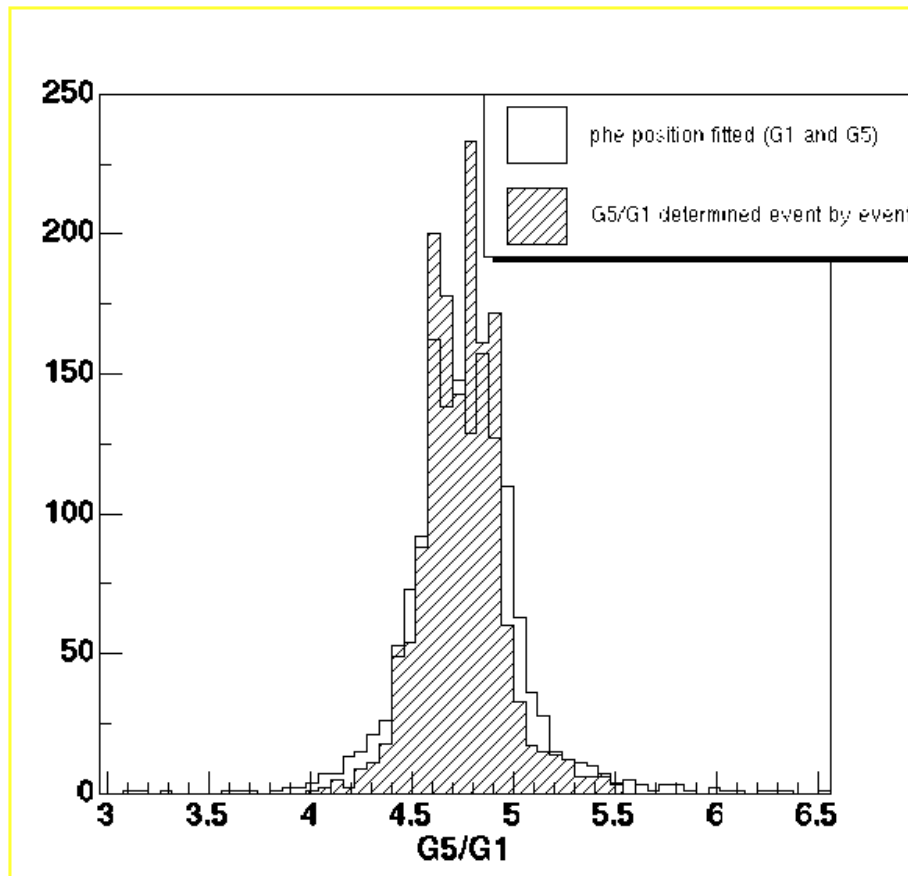
RUN 611 (G5/G1)

RUN 1001 (G5/G1)

# Low Gain Determination:reference comparaison
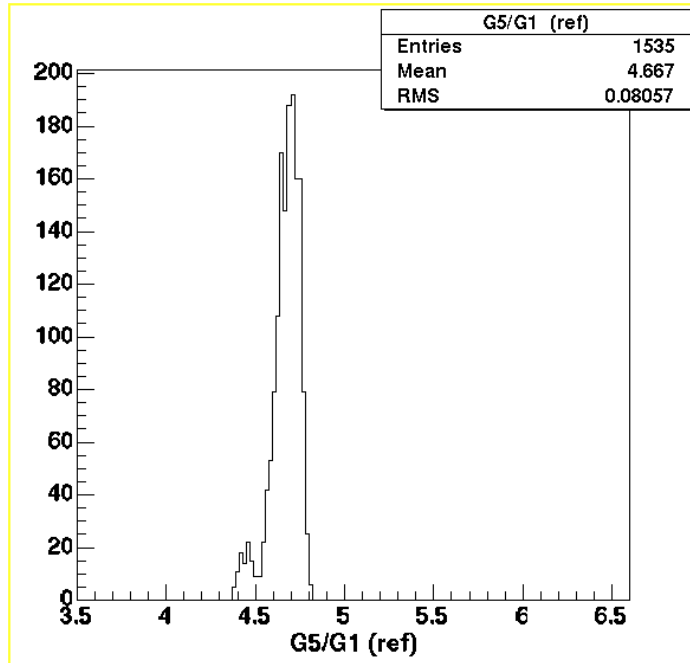
> Bad correlation between tbeam measurements and offline measurements

> Table of reference ratio G_5/G_1 can be produced

Low Gain Determination: fit vs ratio

- G1 determination more difficult using the fit method
  - Higher dispersion on the G5/G1 distribution
- Correlation between the two methods

Velocity Reconstruction
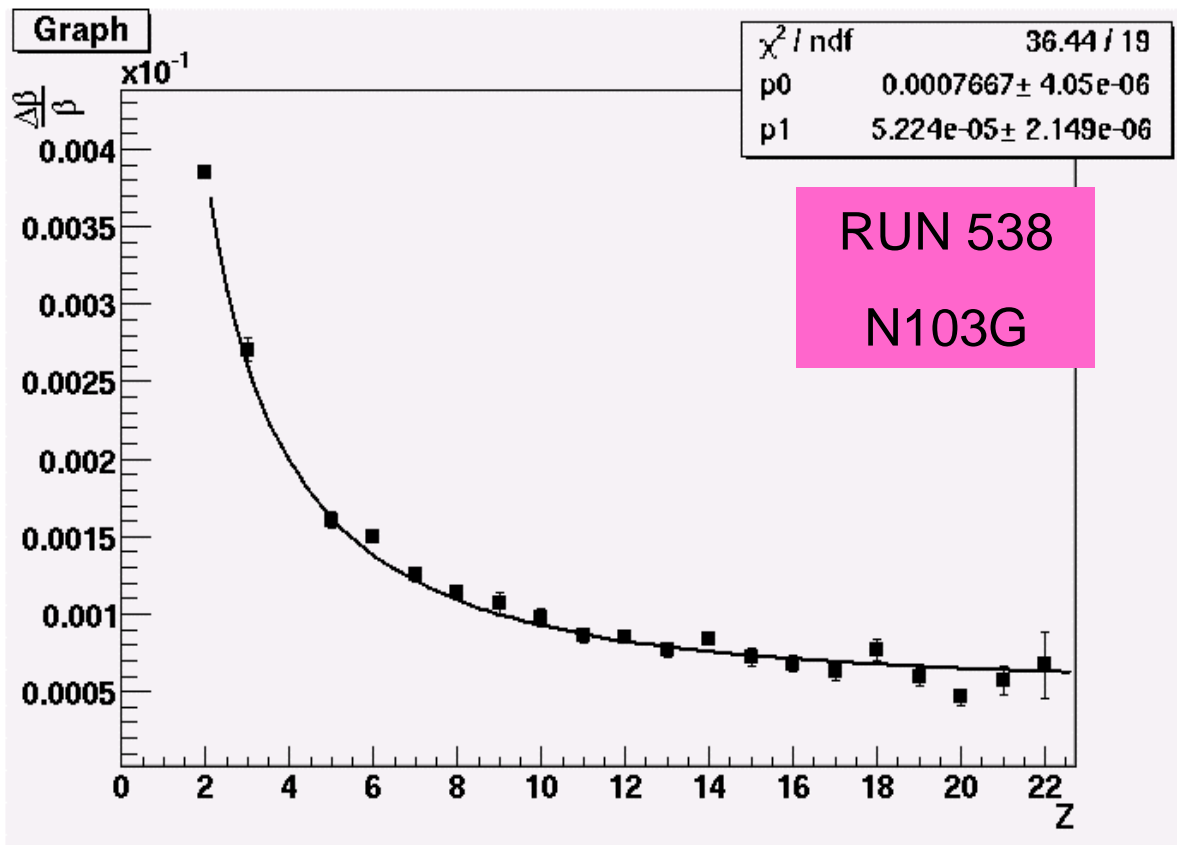
- Fit function:

$$\frac{s(b)}{b} = \sqrt{\left(\frac{P_0}{Z}\right)^2 + P_1^2}$$

- Run 547 (N105) under progress
- Origine from the P1 parameter still to be understood
  - pixel size
  - Rayleigh diffusion