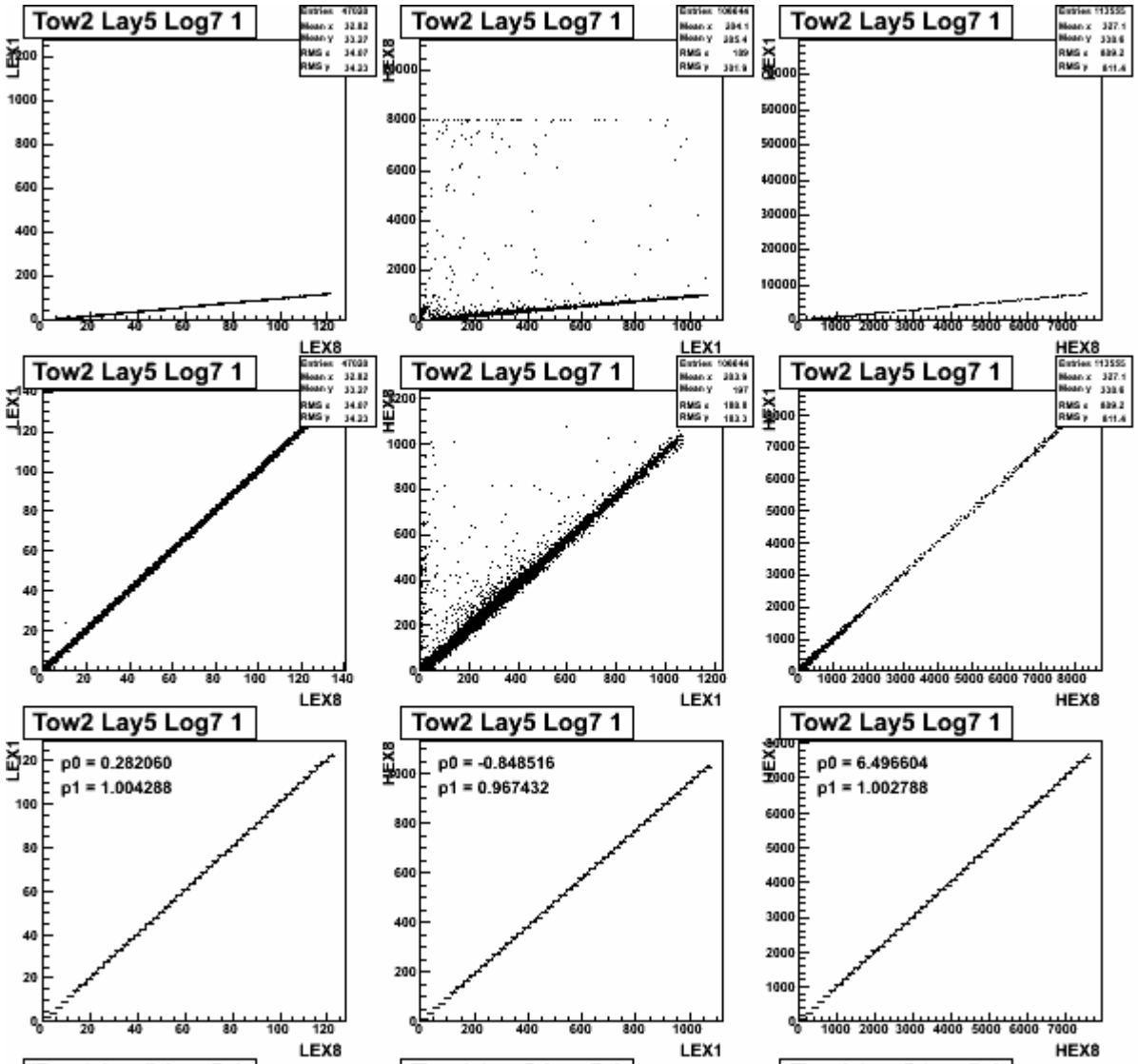
HEX8/LEX1 intercalibration

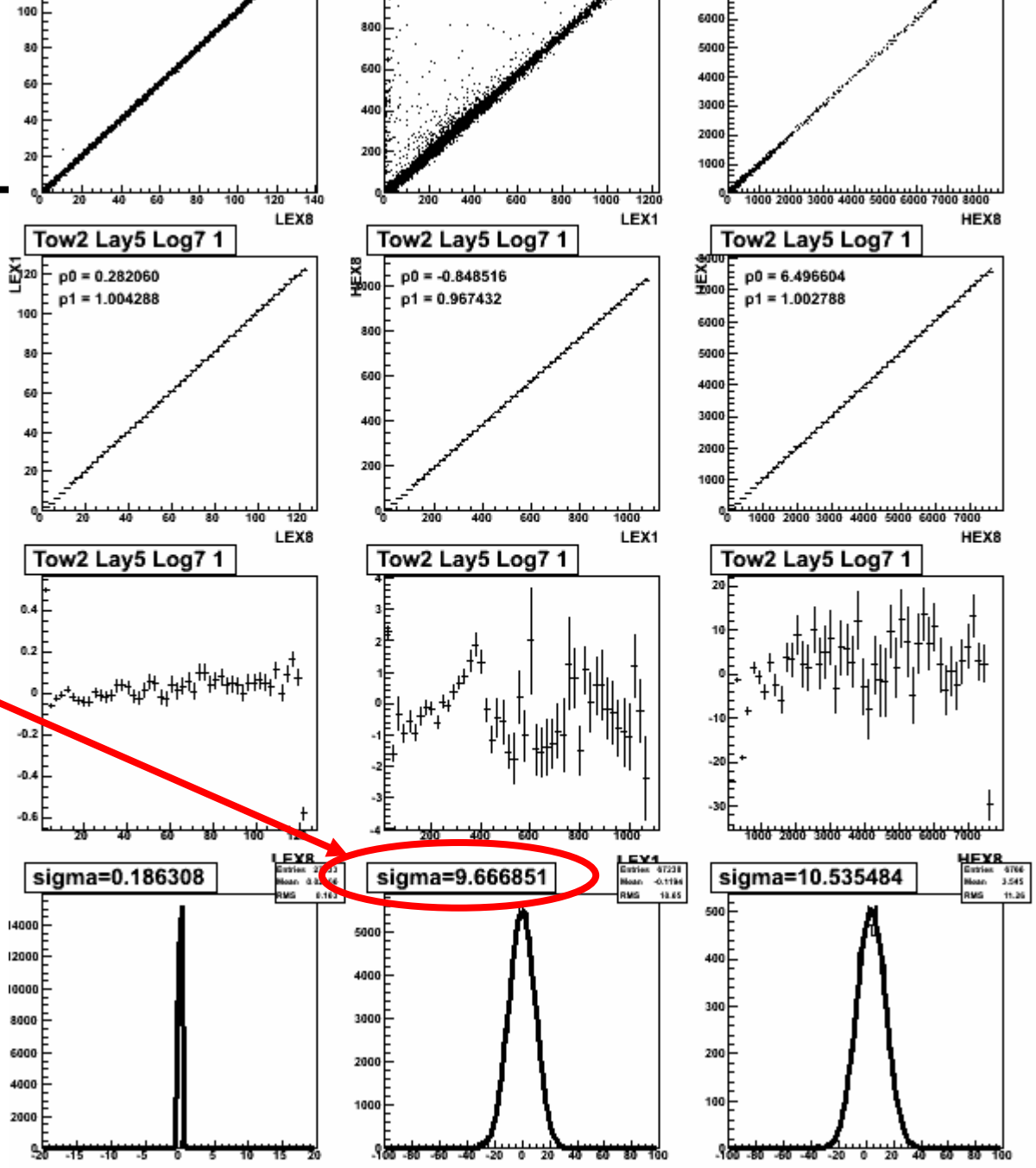
- with reprocessed SPS BT16 runs
- taking into account :
  - Cross-talk between small and large diode
  - DAC non-linearity
- All plots are available at : http://polywww.in2p3.fr/~bruel/ccwww_newsps
  - summary.html
  - problems1.html
  - problems2.html
  - problems3.html

HEX8 vs LEX1

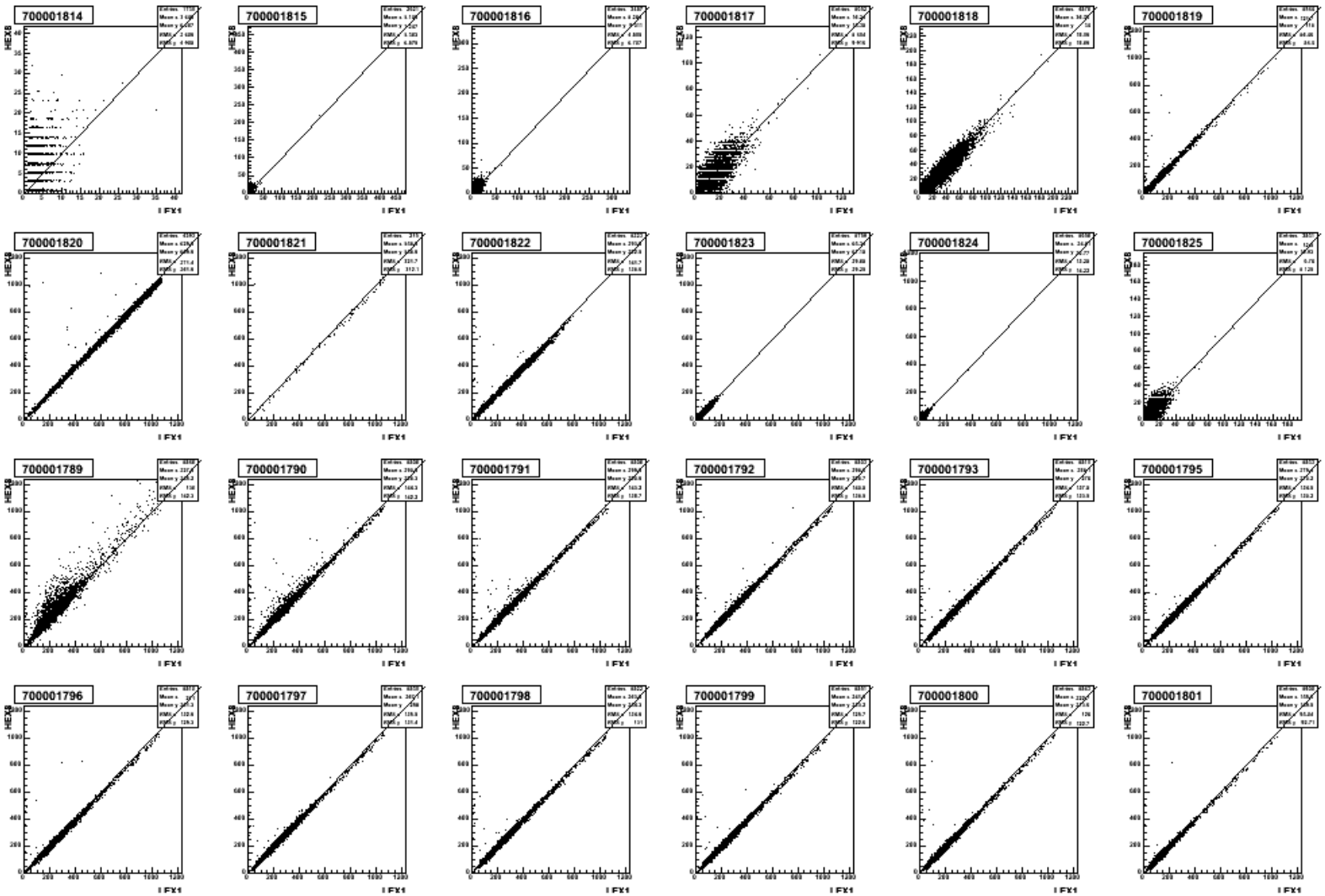
For all log sides : HEX8 vs LEX1 in center plots



- Look at the residuals
- HEX8 – (a+b*LEX1)
- One can check the goodness of the intercalibration with the sigma of the residuals plot

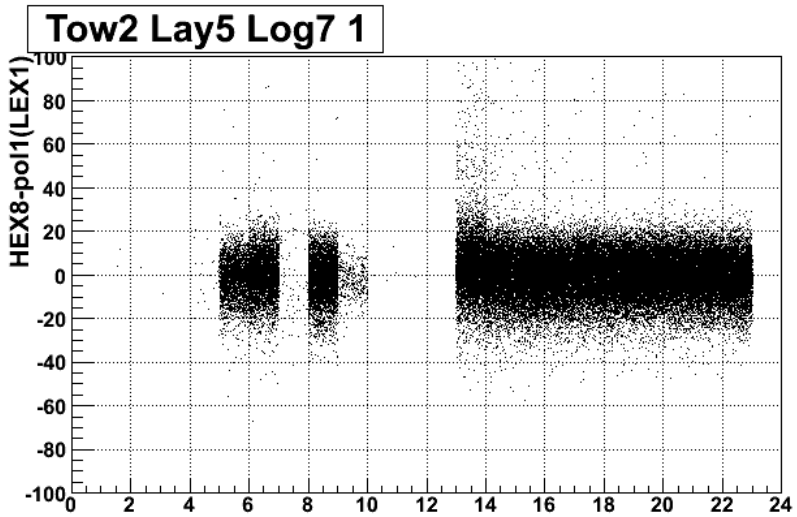


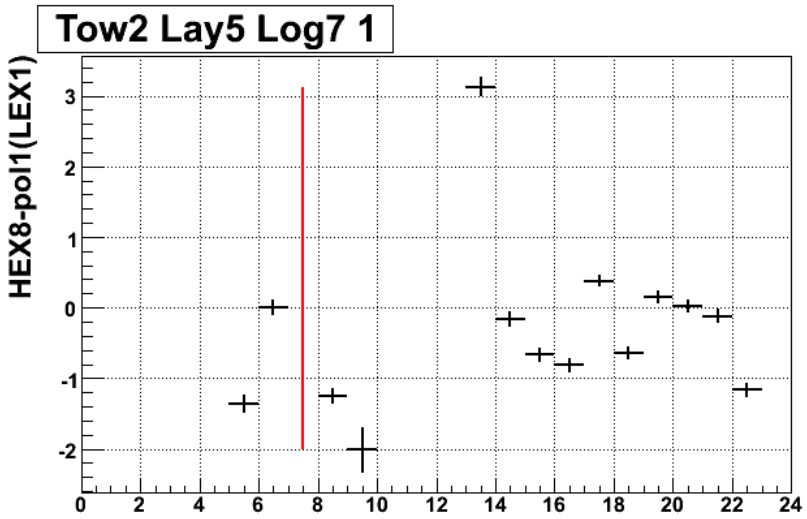
Checking intercalibration for each run



Checking intercalibration summary

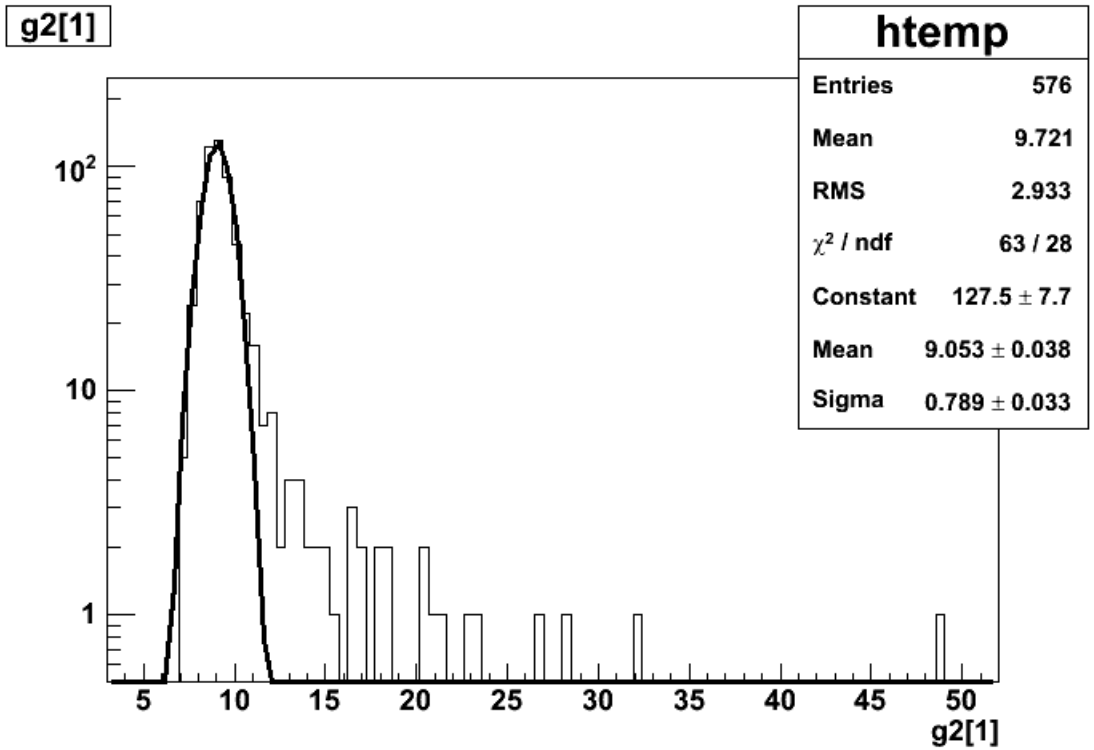
- X axis : run 'number'
- Between 0 and 11 : scan along x
- Between 12 and 23 : scan along y
- The red line indicates the position of the log during the scan perpendicular to its length direction
- Layer 5 is odd so logs along the y axis
- During the scan in x, run 7 shoots in the center of log 7
- During the scan in y (shooting between log 5 and 6), the log 7 will see energy in all runs



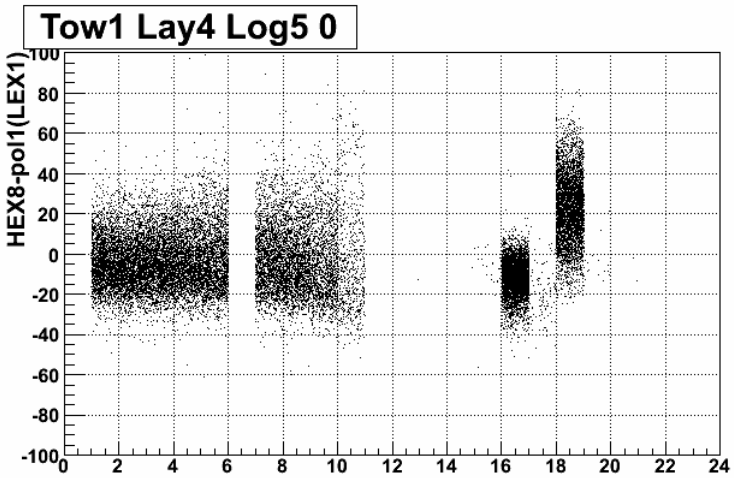


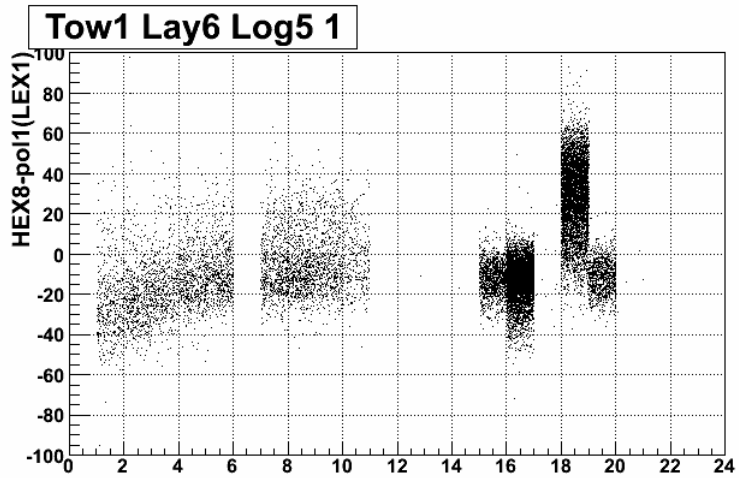
Residuals sigma distribution for all sides

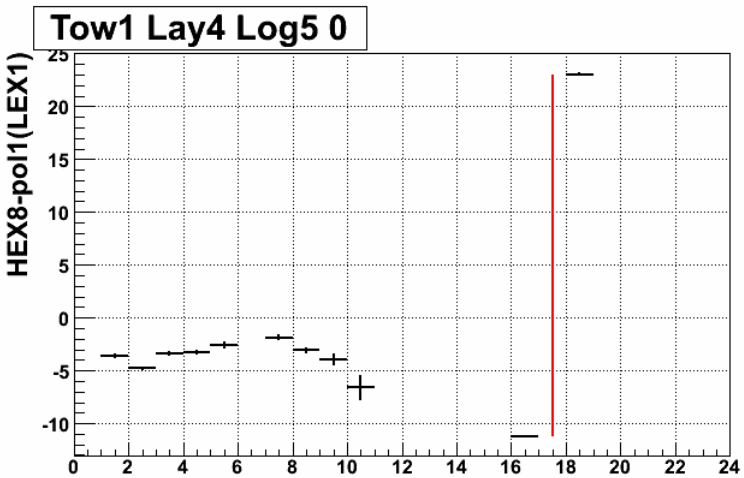
Sigma > 12 -> there is a problem !

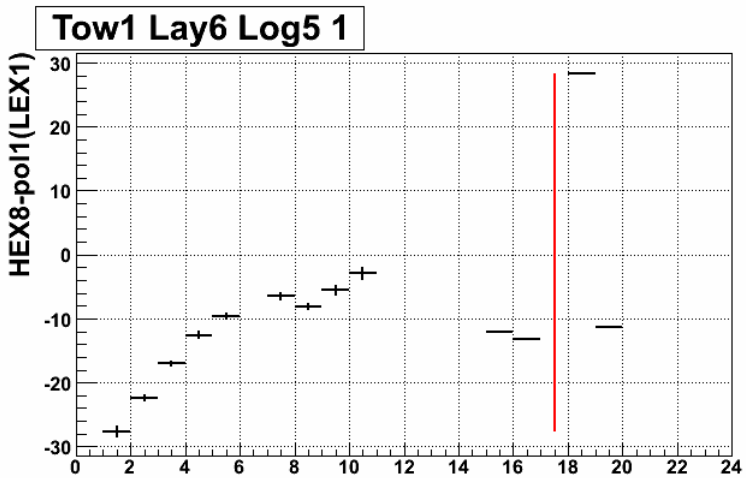


Sometimes it is clear: only one run is weird

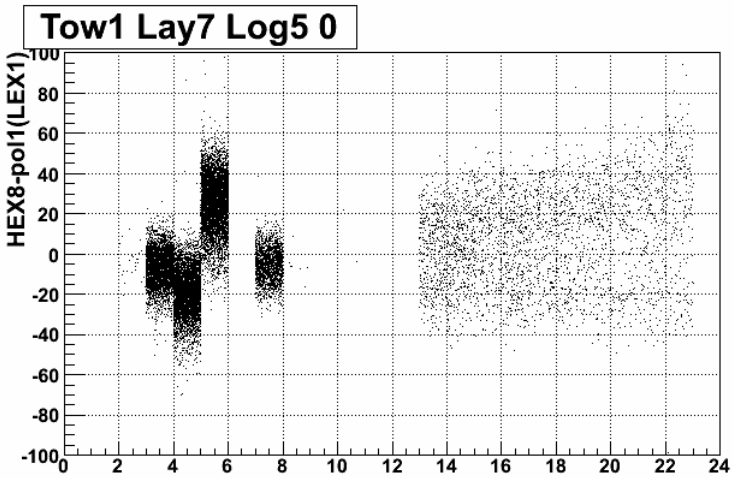


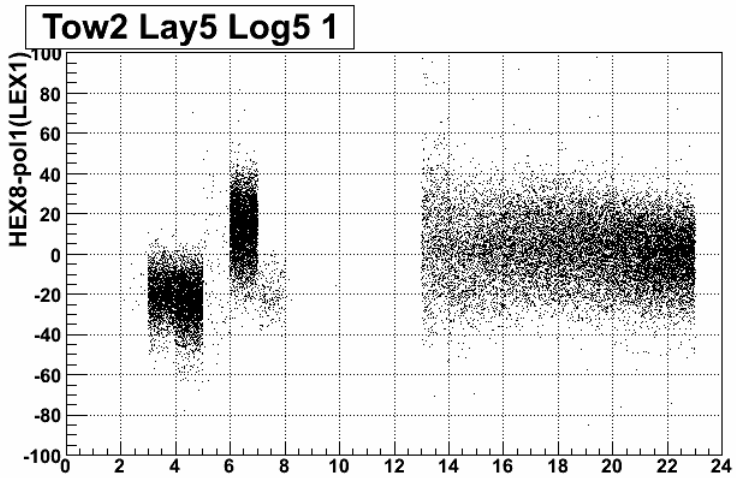


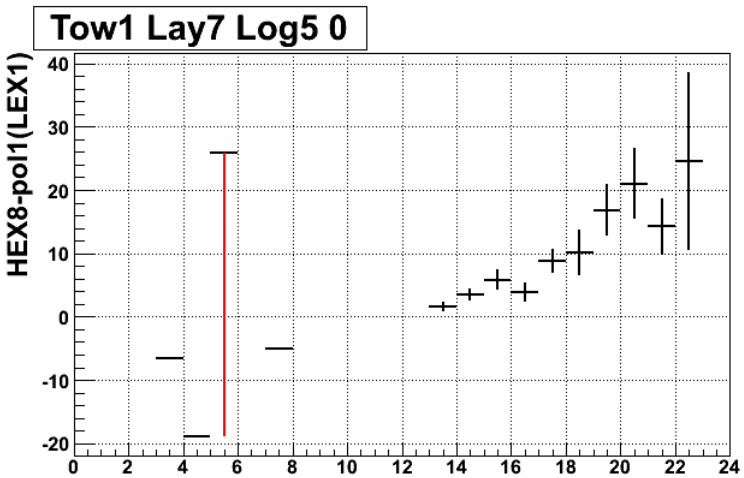


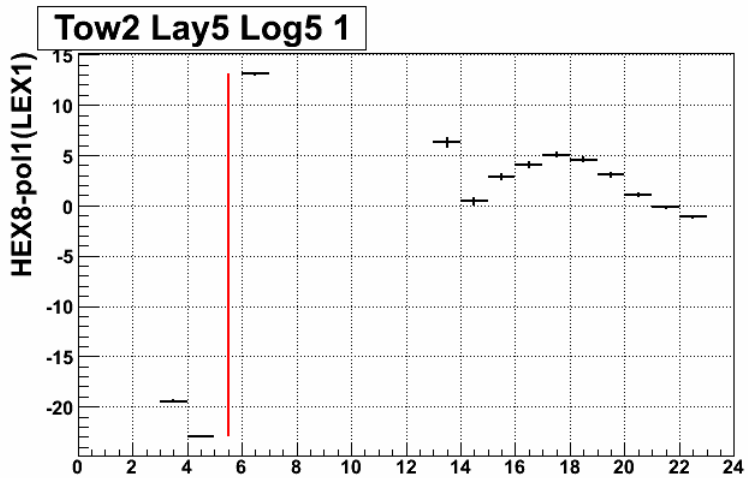


Sometimes it is less clear…

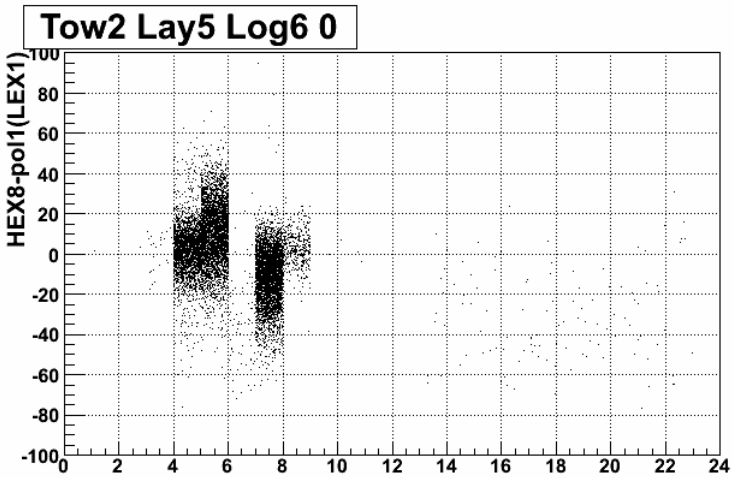


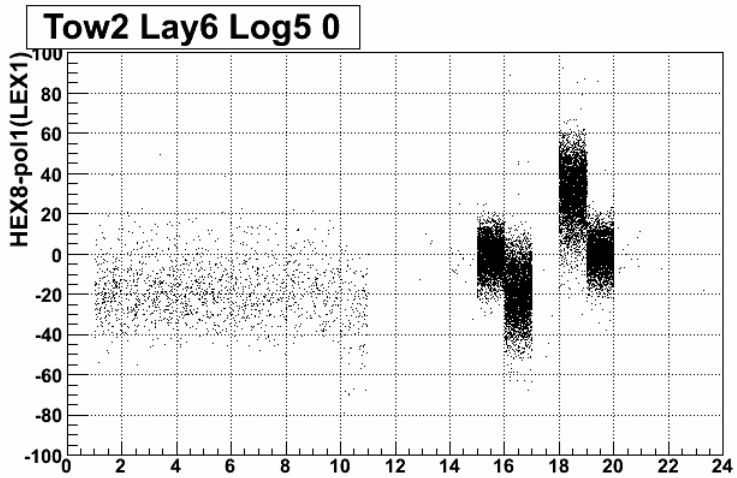


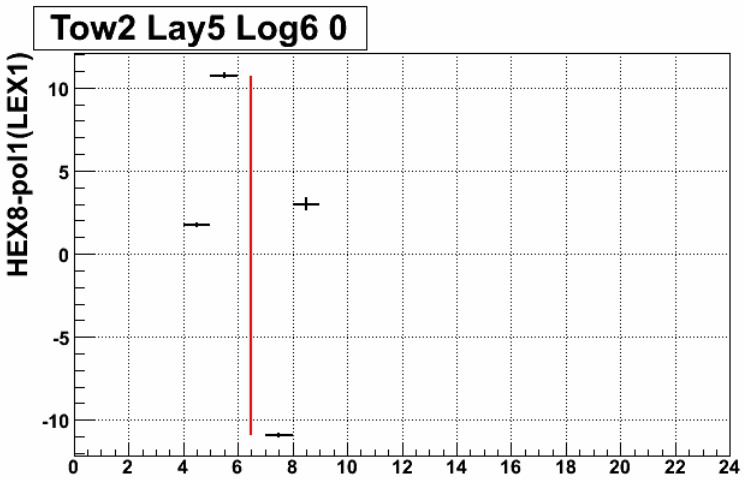


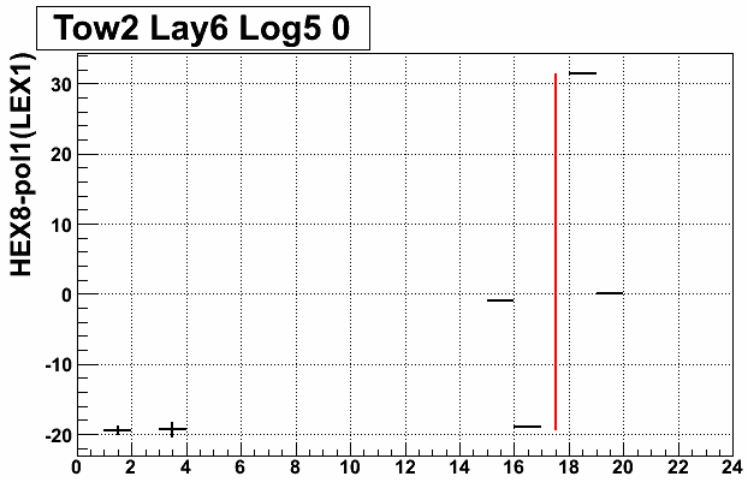


Sometimes it is less clear…

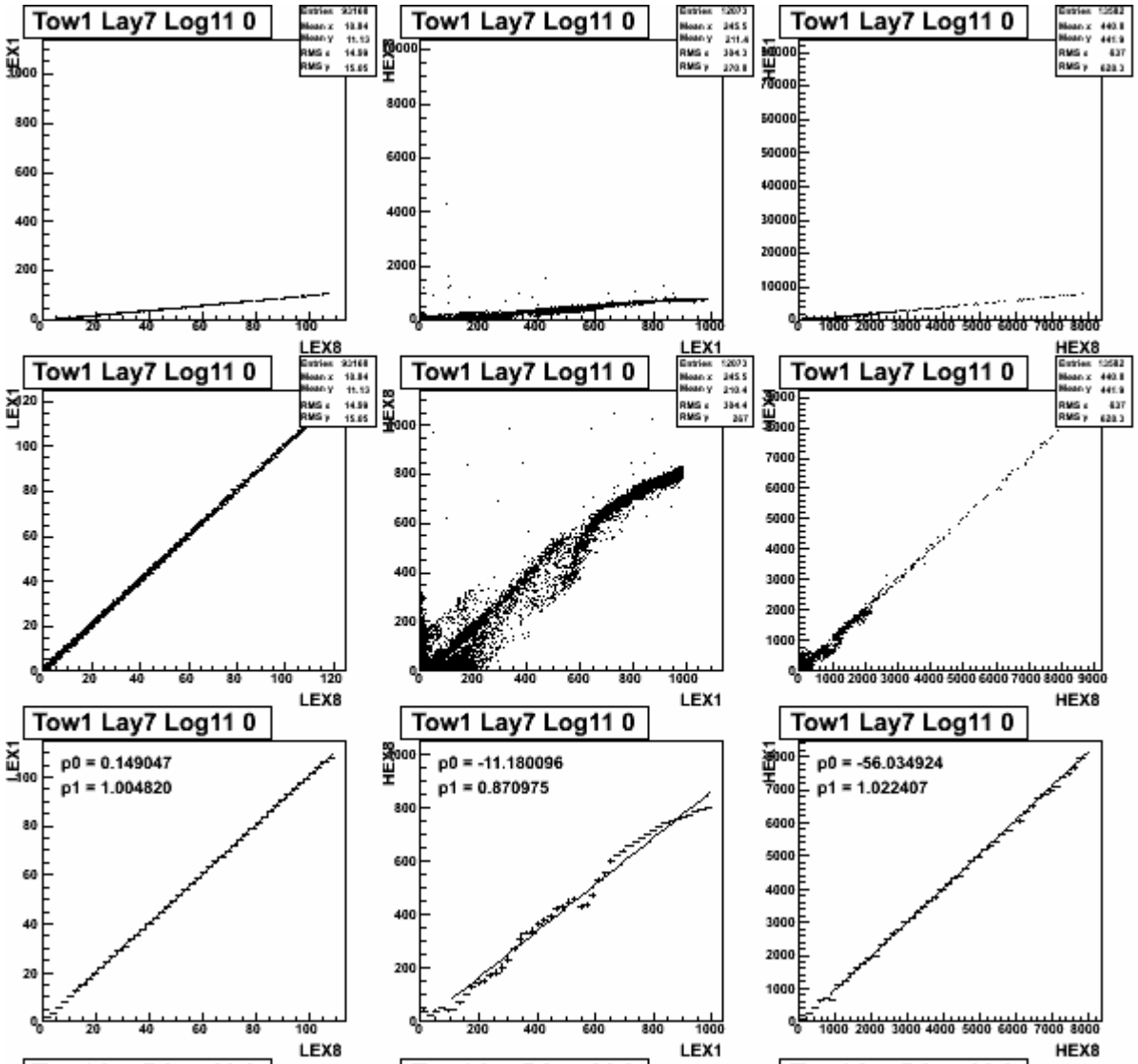




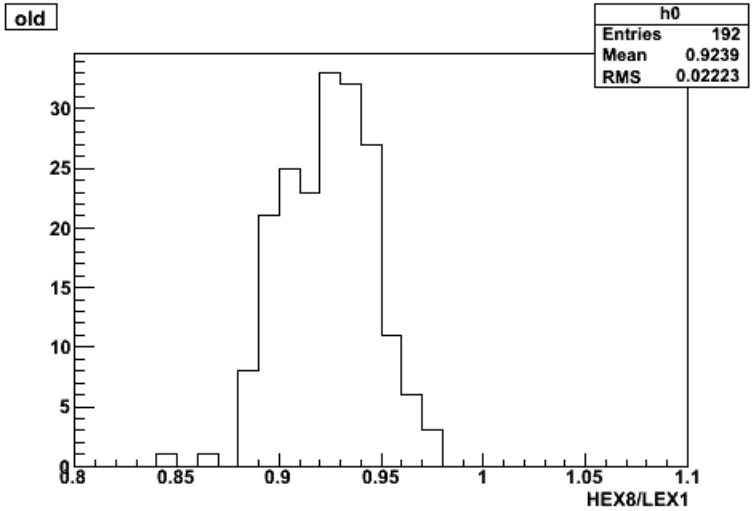


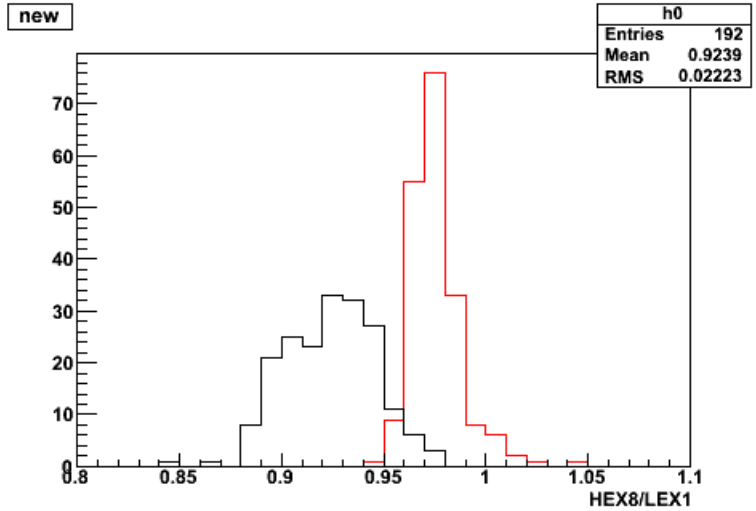


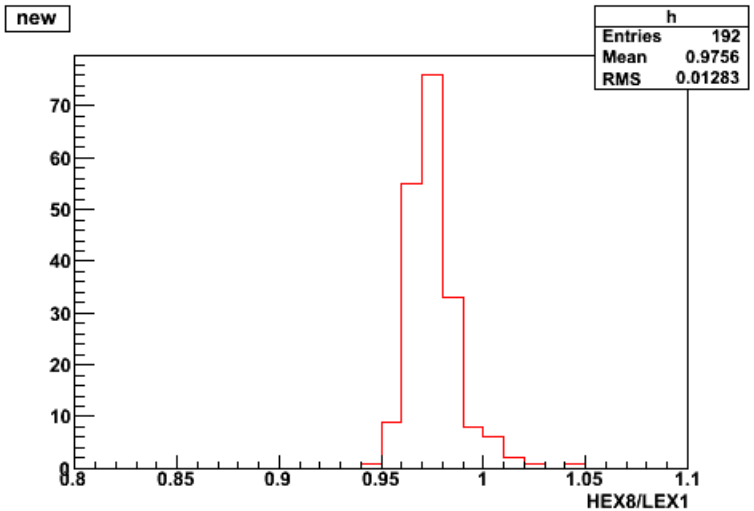
One side has a big problem :



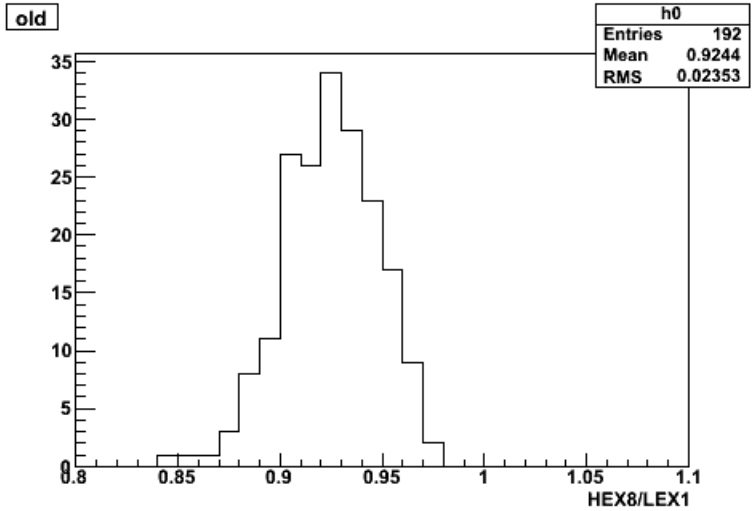
HEX8/LEX1 slope for tower 2

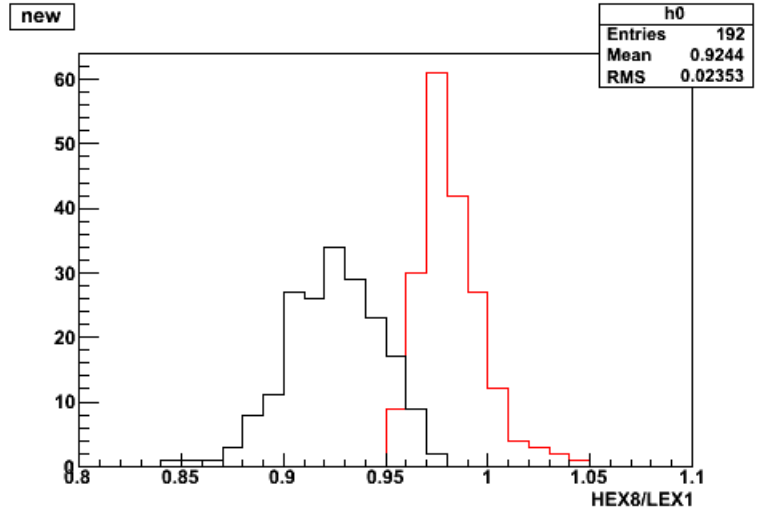


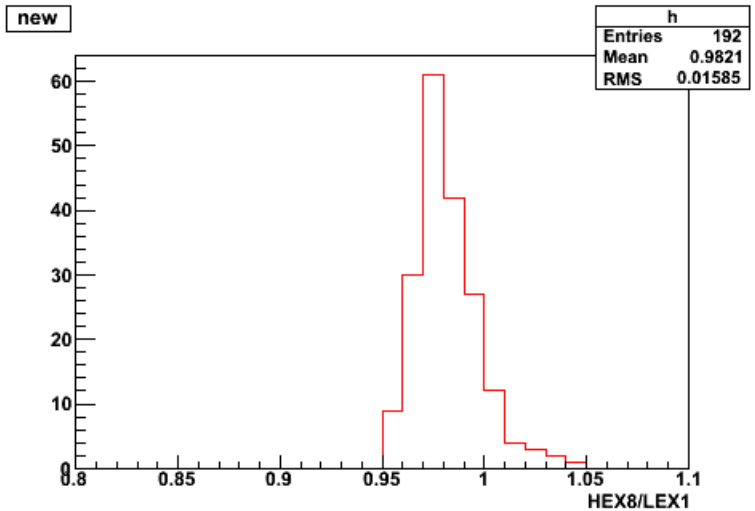




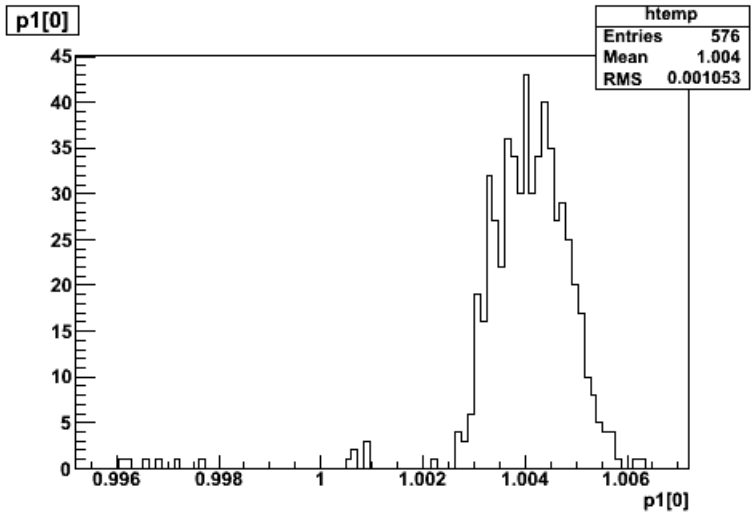
HEX8/LEX1 slope for tower 3

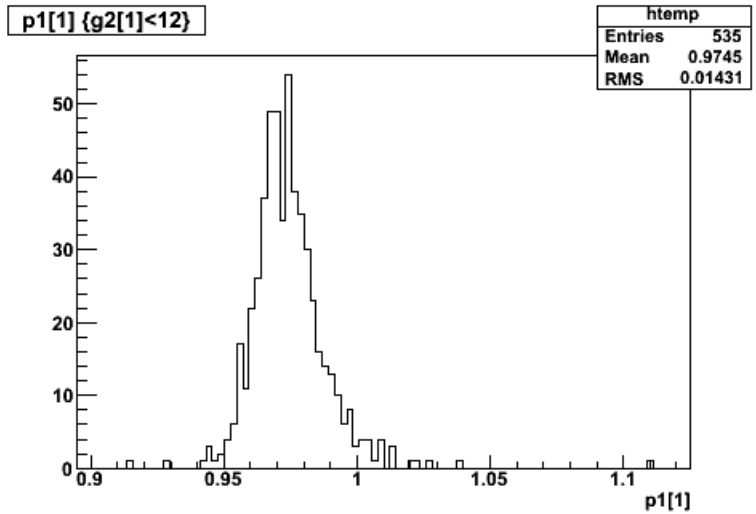


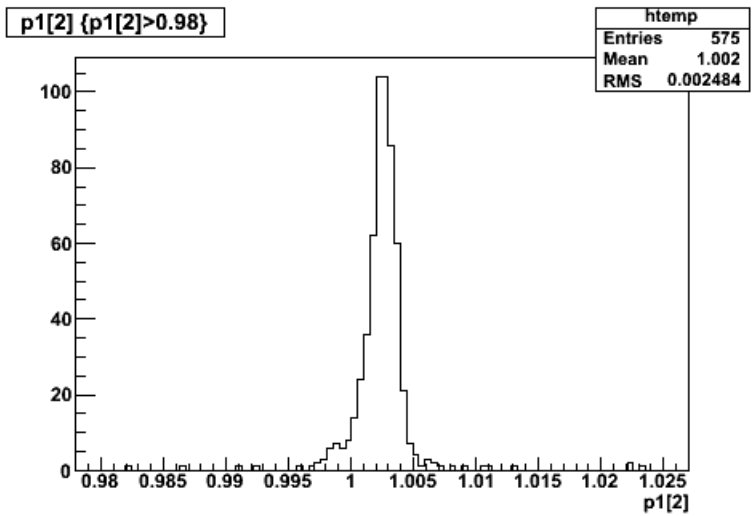




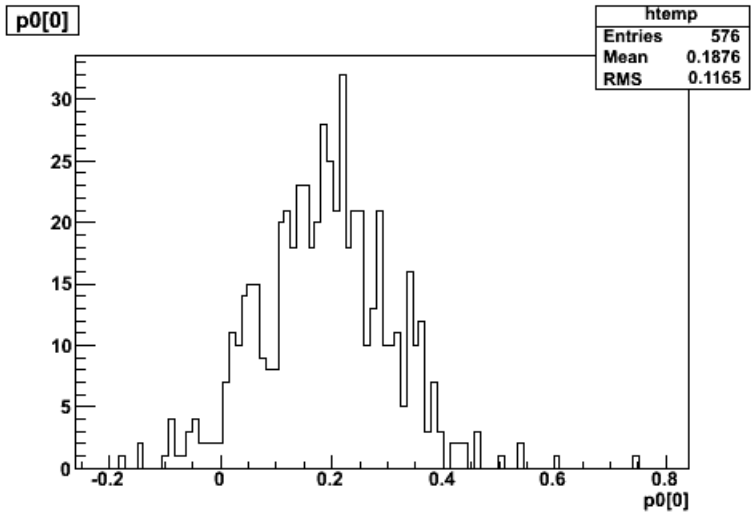
All slopes : LEX1/LEX8, HEX8/LEX1, HEX1/HEX8

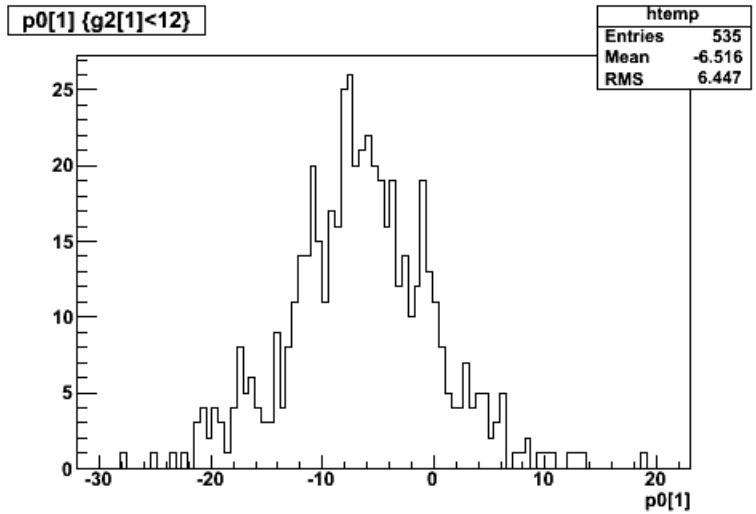


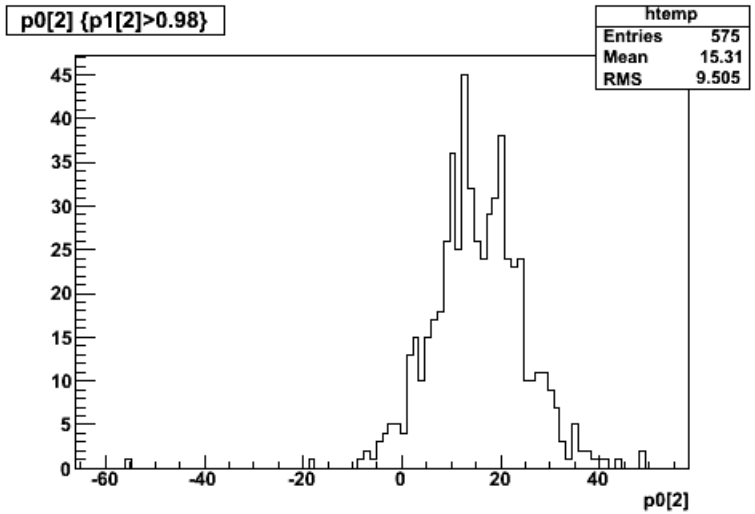




Intercepts : LEX1/LEX8, HEX8/LEX1, HEX1/HEX8







Conclusions

- 41 sides (out of 576) with large residuals sigma
  - Indication of remaining non-linearities ?
  - Cross-talk between logs ?
  - Experts should look at these channels and say how to proceed
  - We can assign mean slope value (0.975) to these channels
- We have won 5% in the right direction !!!
- Do we have to correct for LEX1/LEX8 and HEX1/HEX8 slopes ?
- Correct LEX1 or HEX8 ?
  - Given these new results, it seems that we can safely correct HEX8 as in the normal procedure
- These 5% means that data and MC should agree up to 20 GeV.
- Above 20 GeV, we can hope that the non-linearity correction will also provide a good agreement…
- Try to have a new database as soon as possible and reprocess 0deg SPS runs at 50, 100, 20 and 280 GeV.