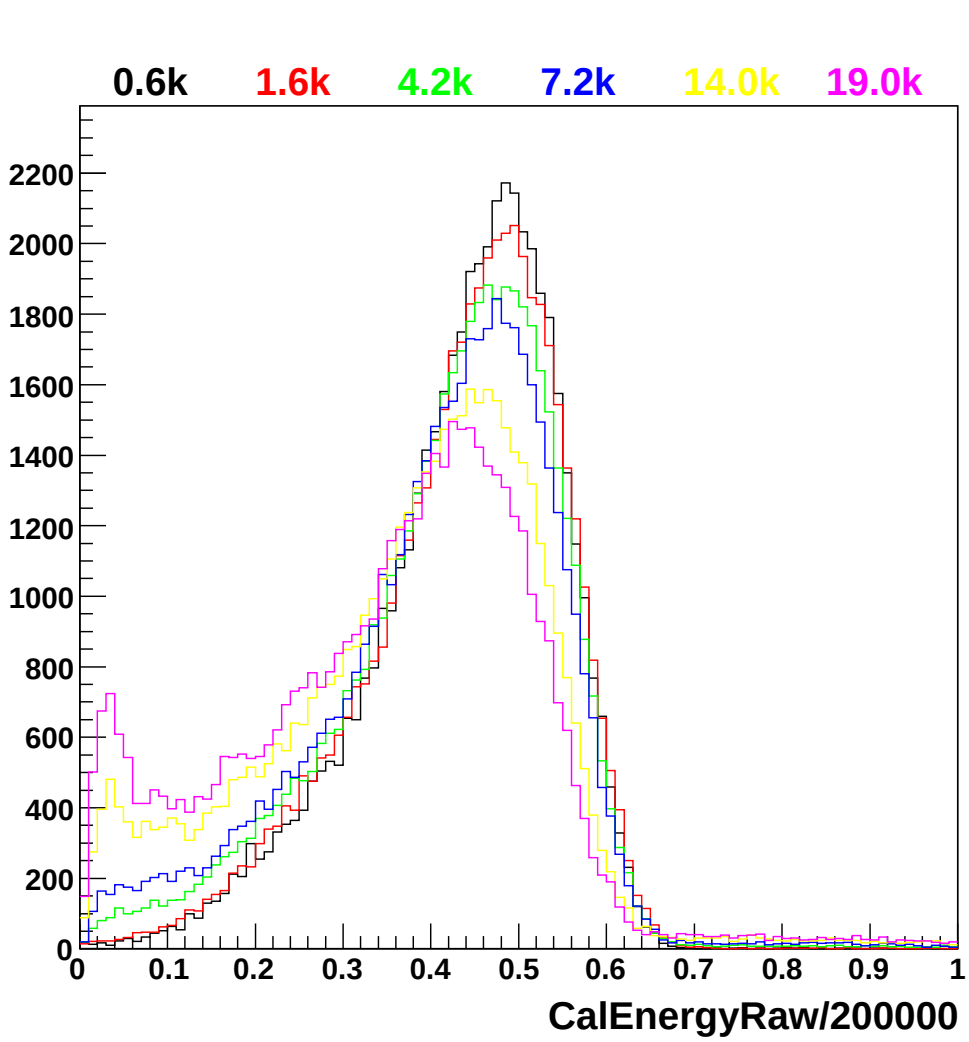
About calorimeter studies

- Energy problem :
  - reminder of previous studies
  - looking back at calibration runs
- this problem is not only about energy measurement :
  - calorimeter positions are affected
  - rejection variables are affected !

Pedestal drift effect

100 GeV electrons runs at different trigger rate (runs 1782 to 1787)

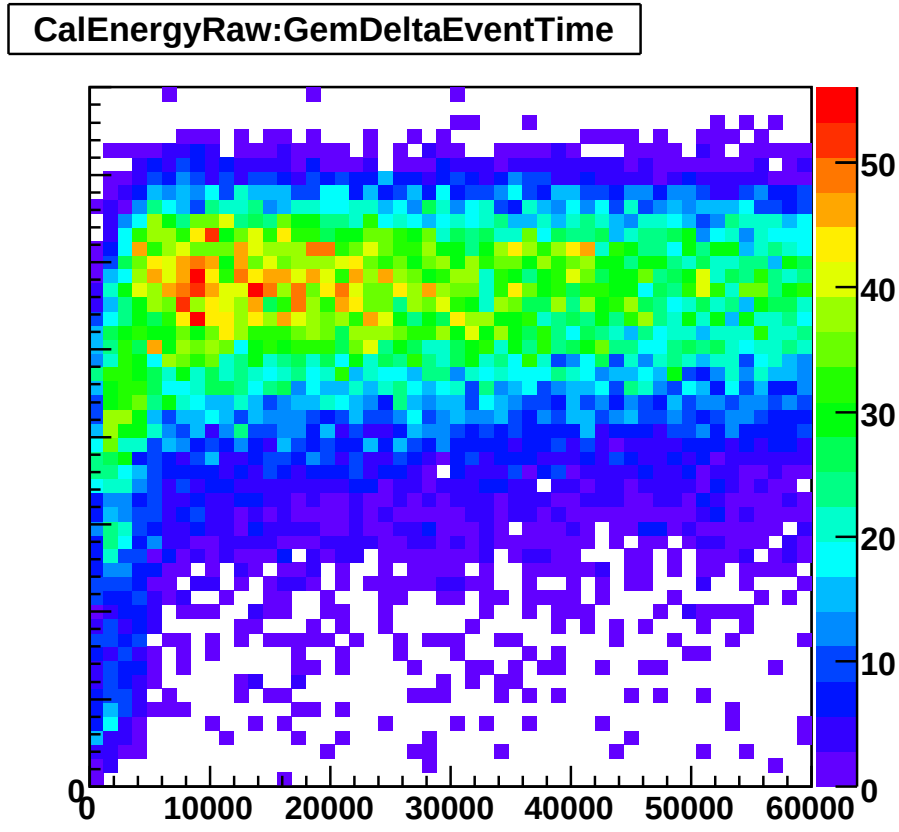
$\Rightarrow$ the maximum trigger rate was set to $\sim$ 200 Hz during a spill

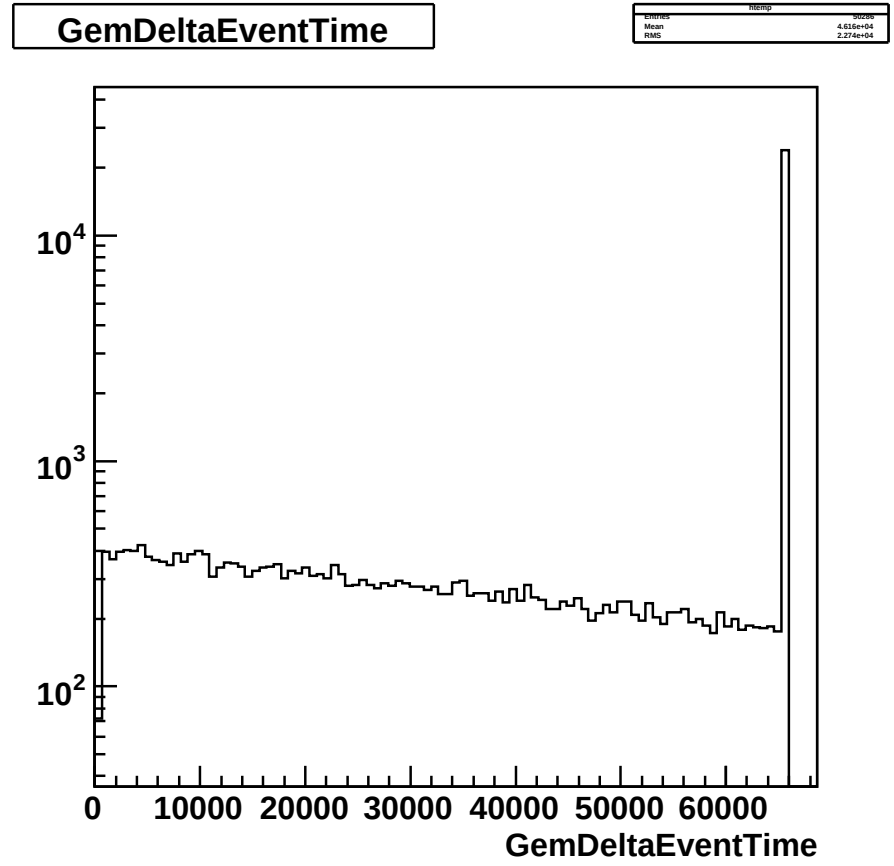


Pedestal drift effect

100 GeV electrons run 2024

with the typical rate at SPS, the effect is small but still visible

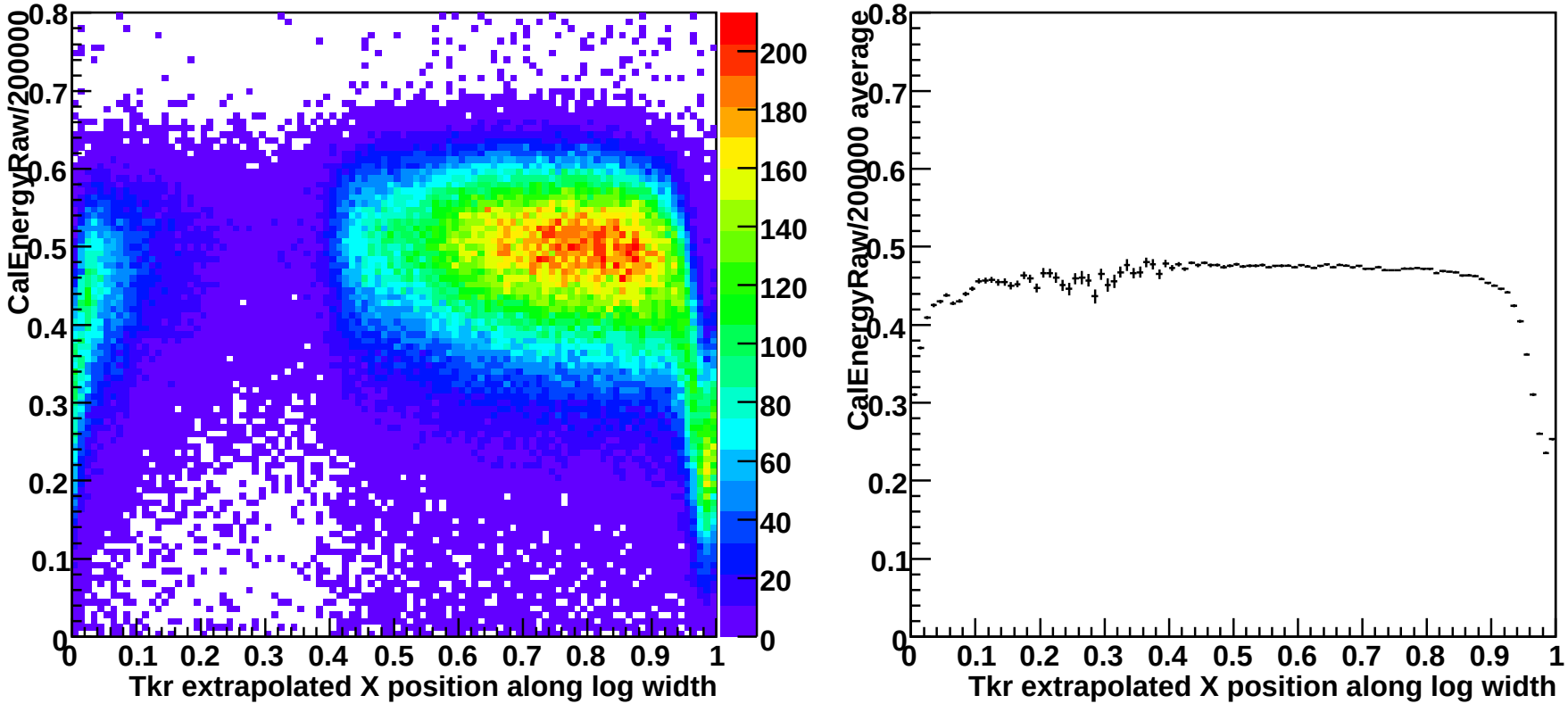




Inter-log effect

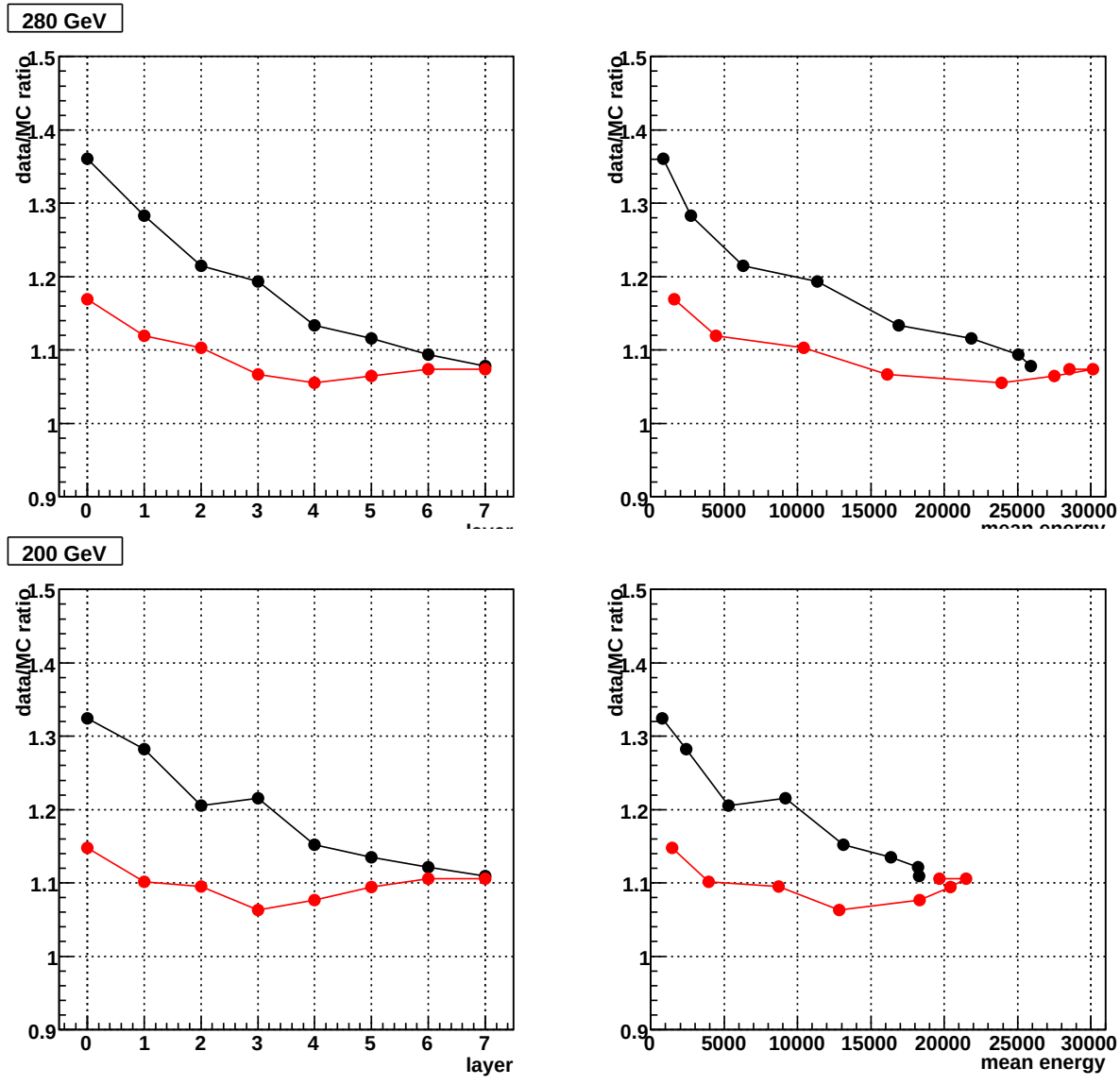
200 GeV electrons in the center of the towers at 0 deg

$\Rightarrow$ Be careful when comparing energy histograms between data and simulations !



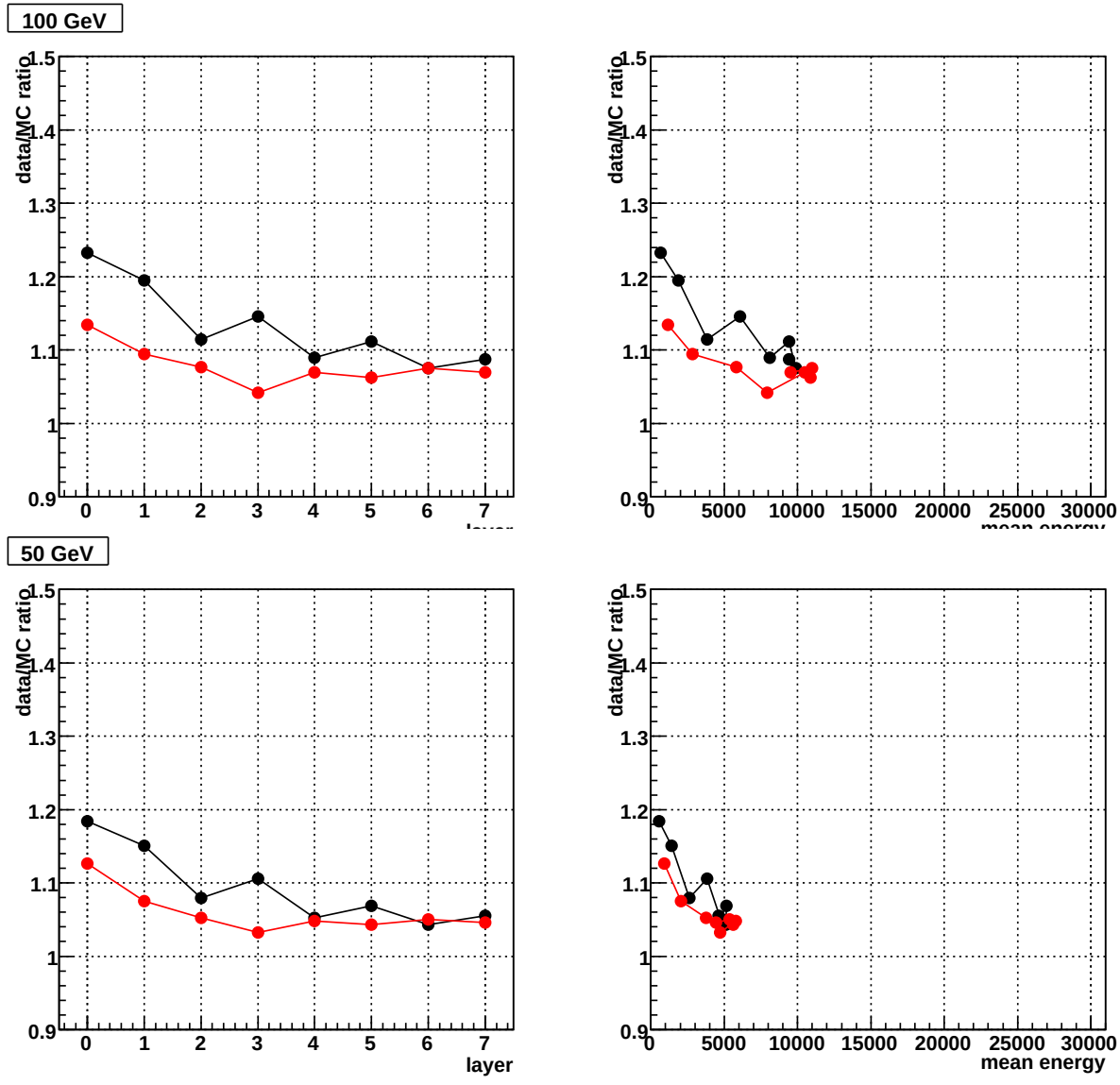
Layer correction at 280 and 200 GeV

black : 0 deg - red : 30 deg



Layer correction at 100 and 50 GeV

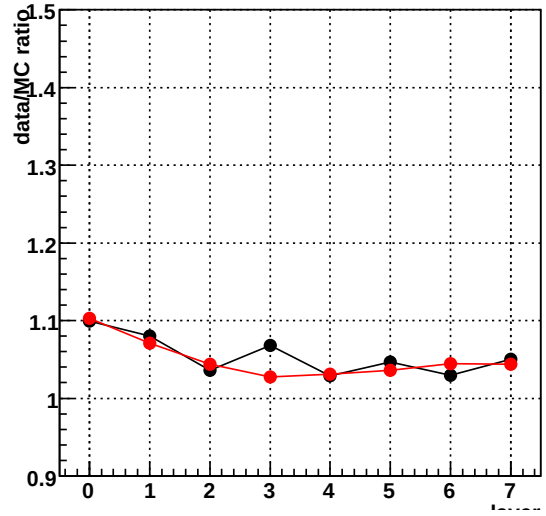
black : 0 deg - red : 30 deg

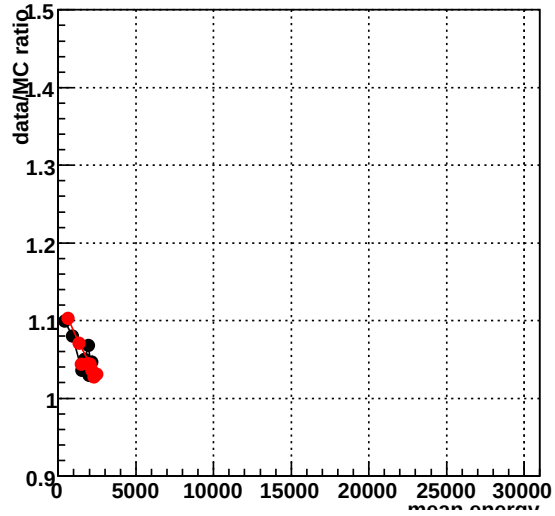


Layer correction at 20 and 10 GeV

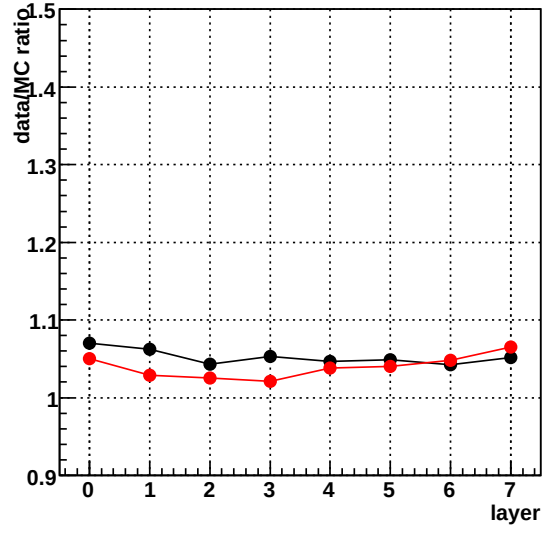
black : 0 deg - red : 30 deg

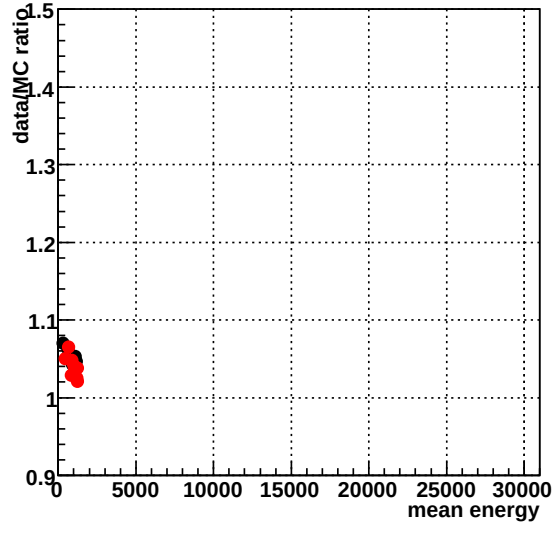
20 GeV





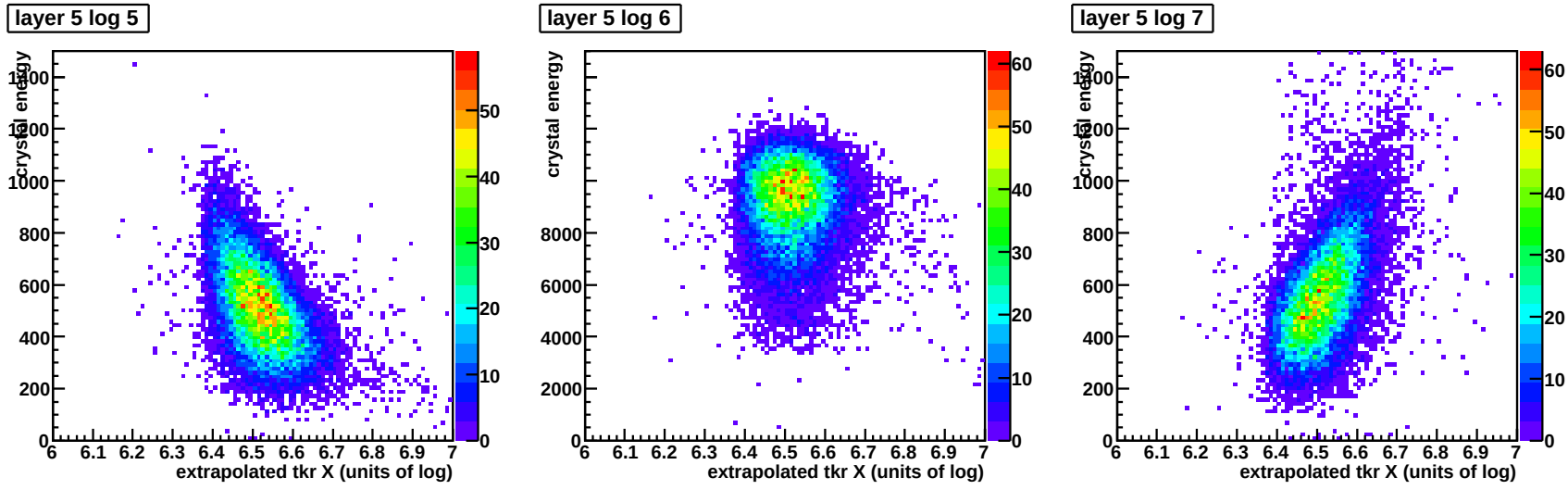
10 GeV



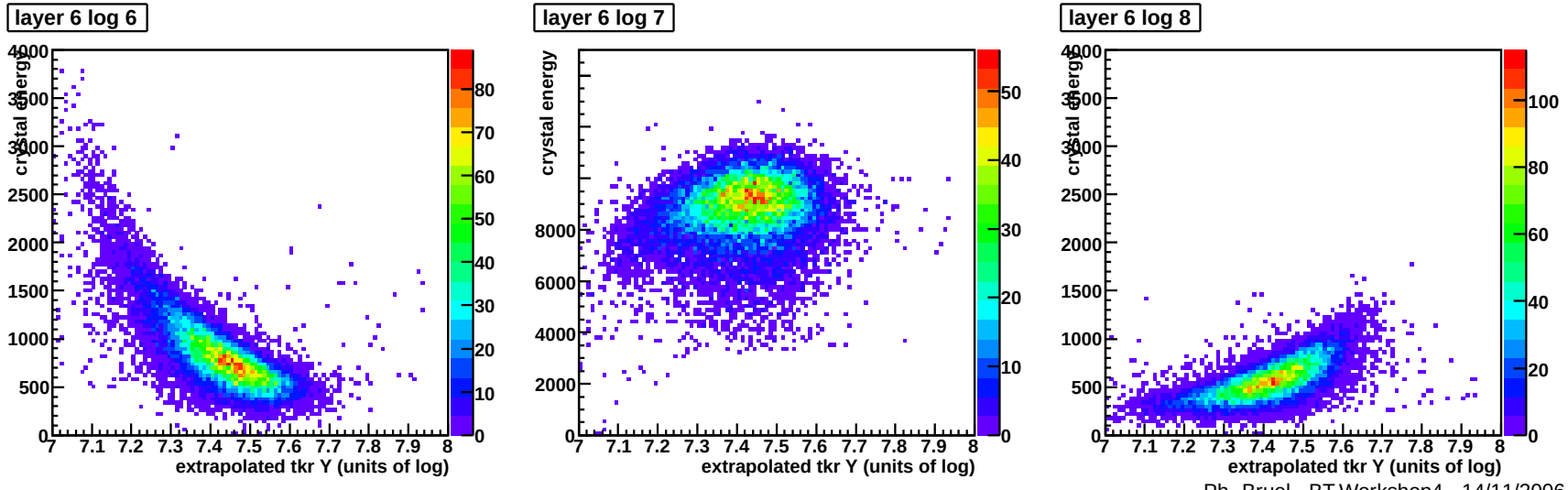


At the crystal level

layer 5 $\Rightarrow$ looking at the energy of the crystals versus X

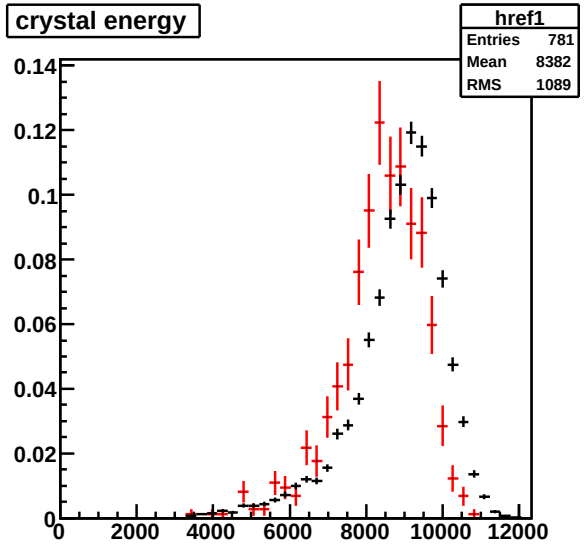


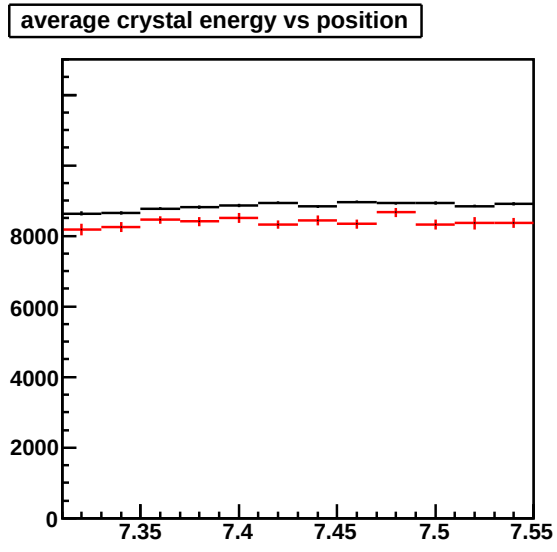
layer 6 $\Rightarrow$ looking at the energy of the crystals versus Y

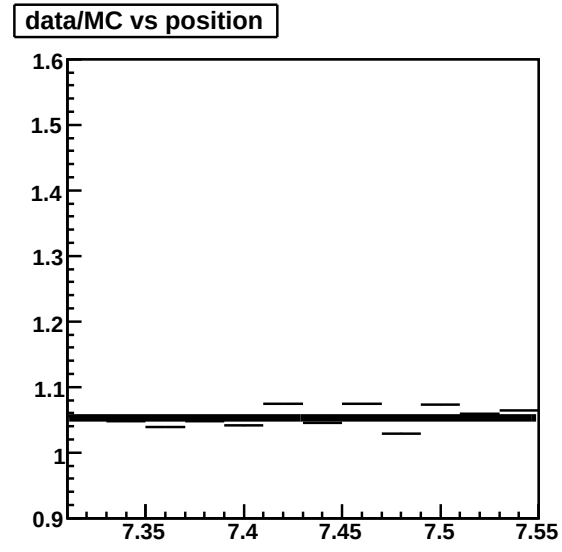


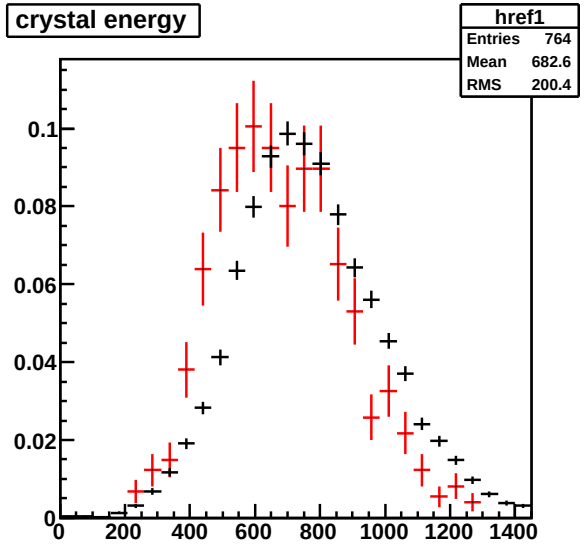
Data/MC comparison

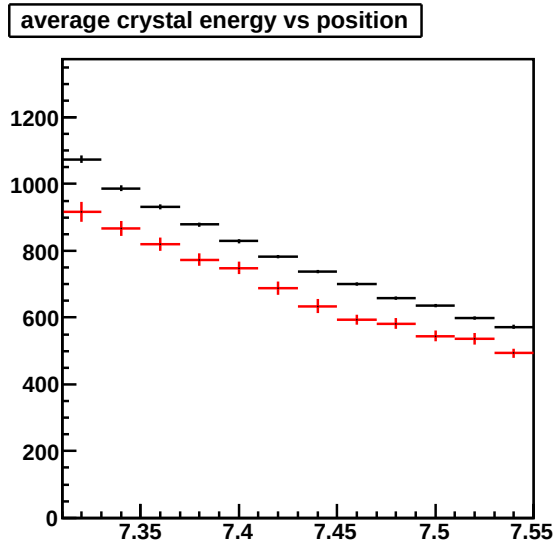
red : MC (Beamtest-0162) - black : run 700002024

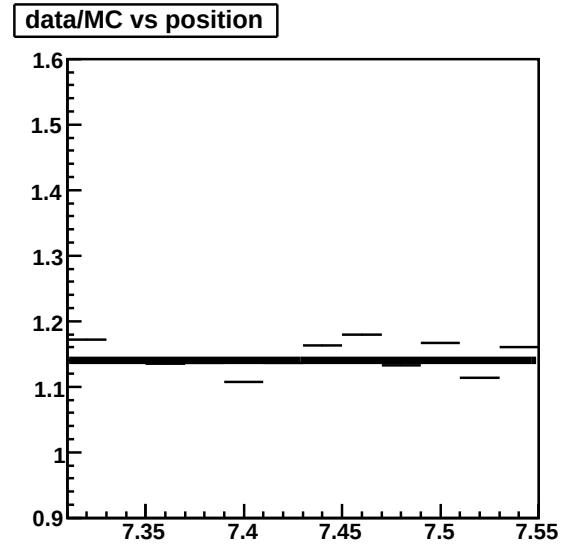


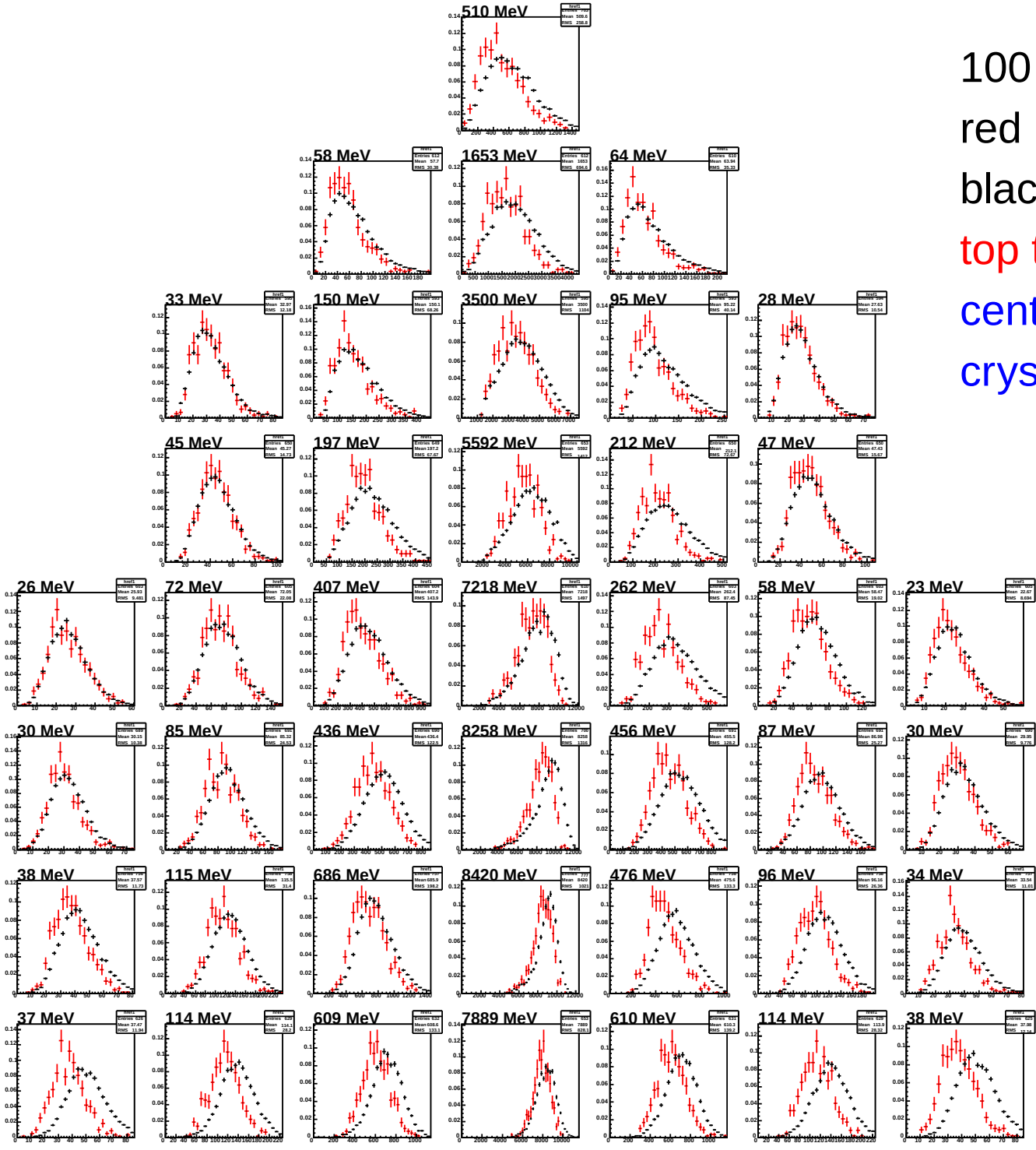












100 GeV

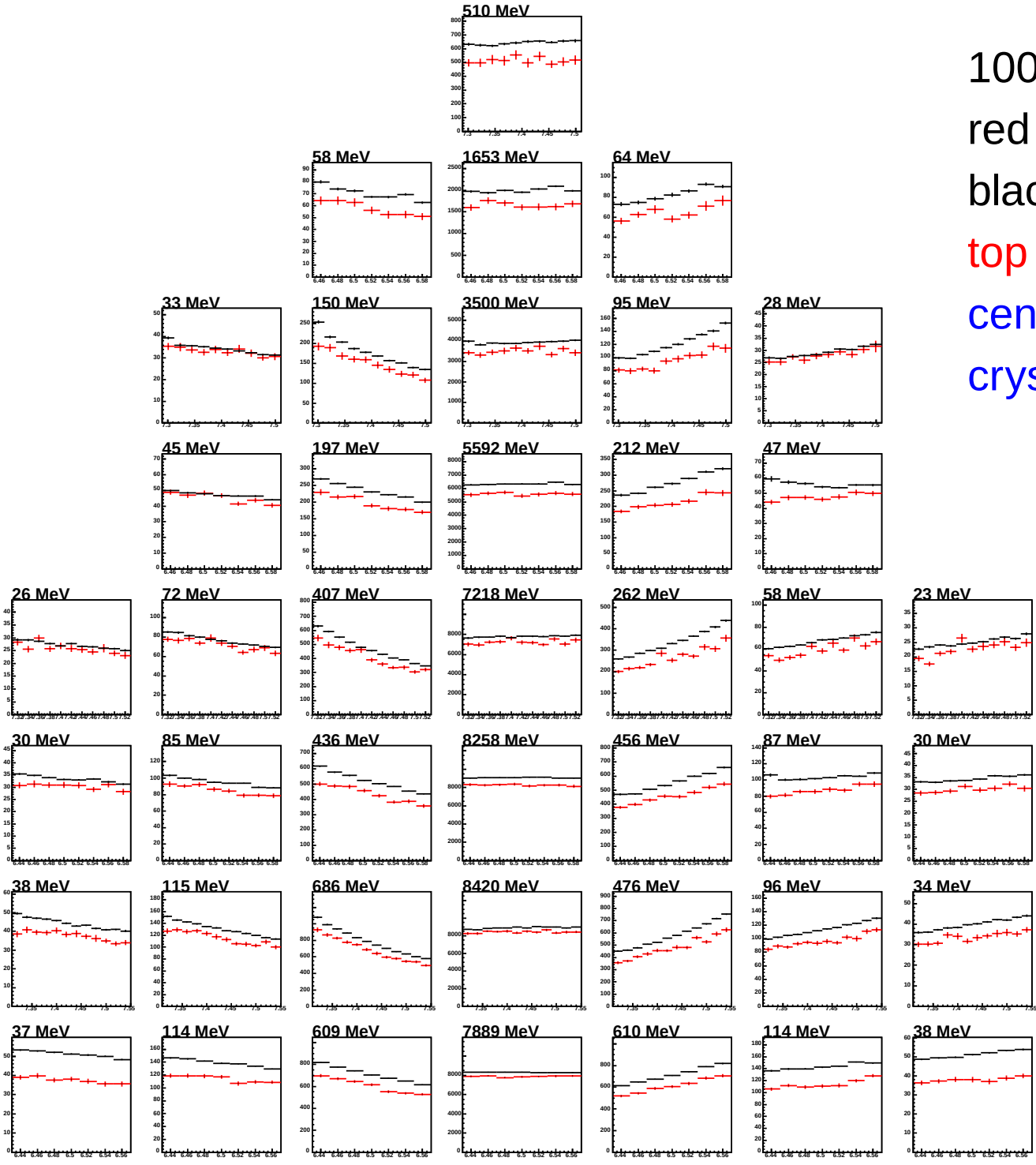
red : MC (Beamtest-0162)

black : run 700002024

top to bottom : layer 0 to 7

central column :

crystals along trajectory



100 GeV

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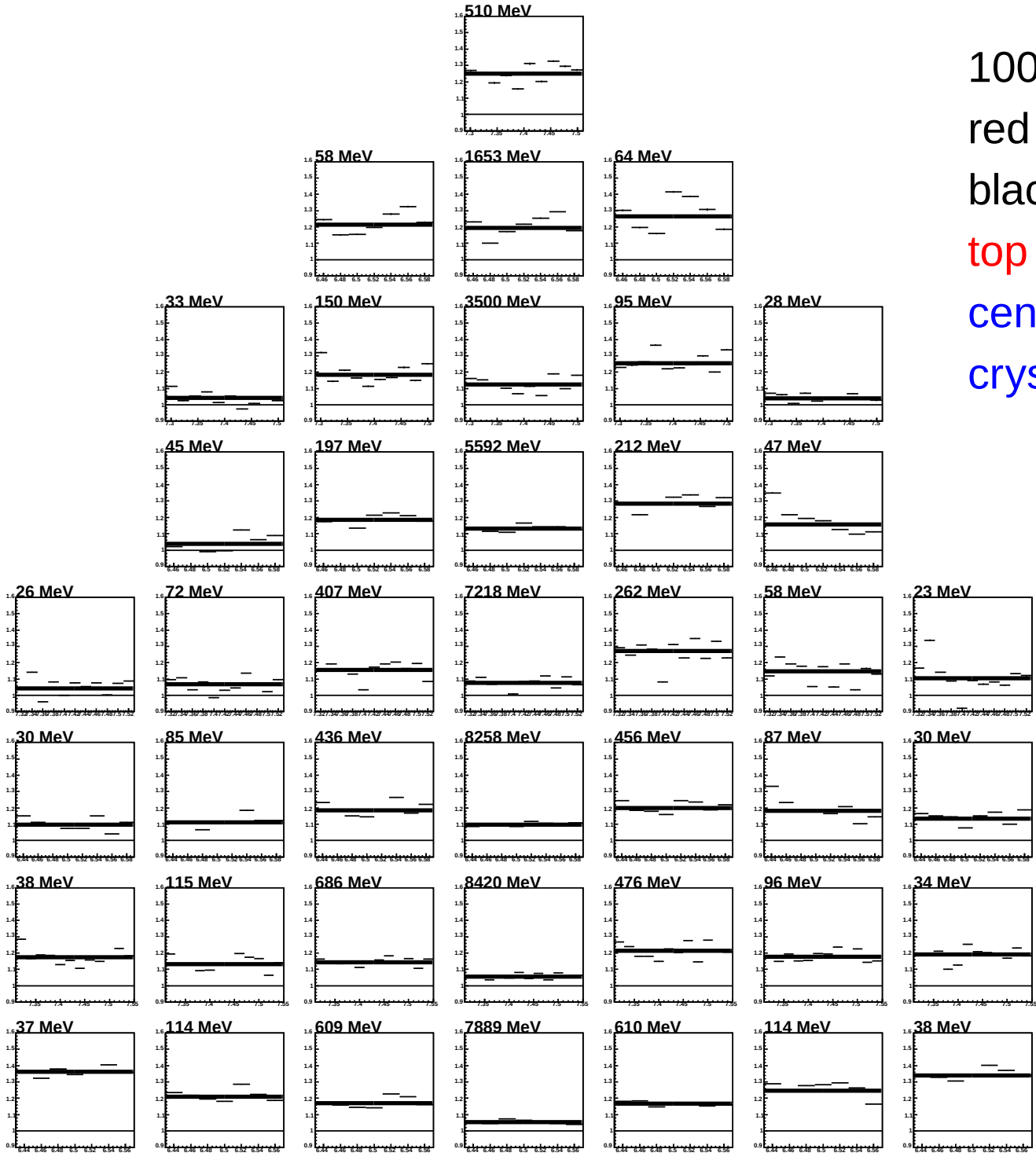


100 GeV

red : MC (Beamtest-0162)

black : run 700002024

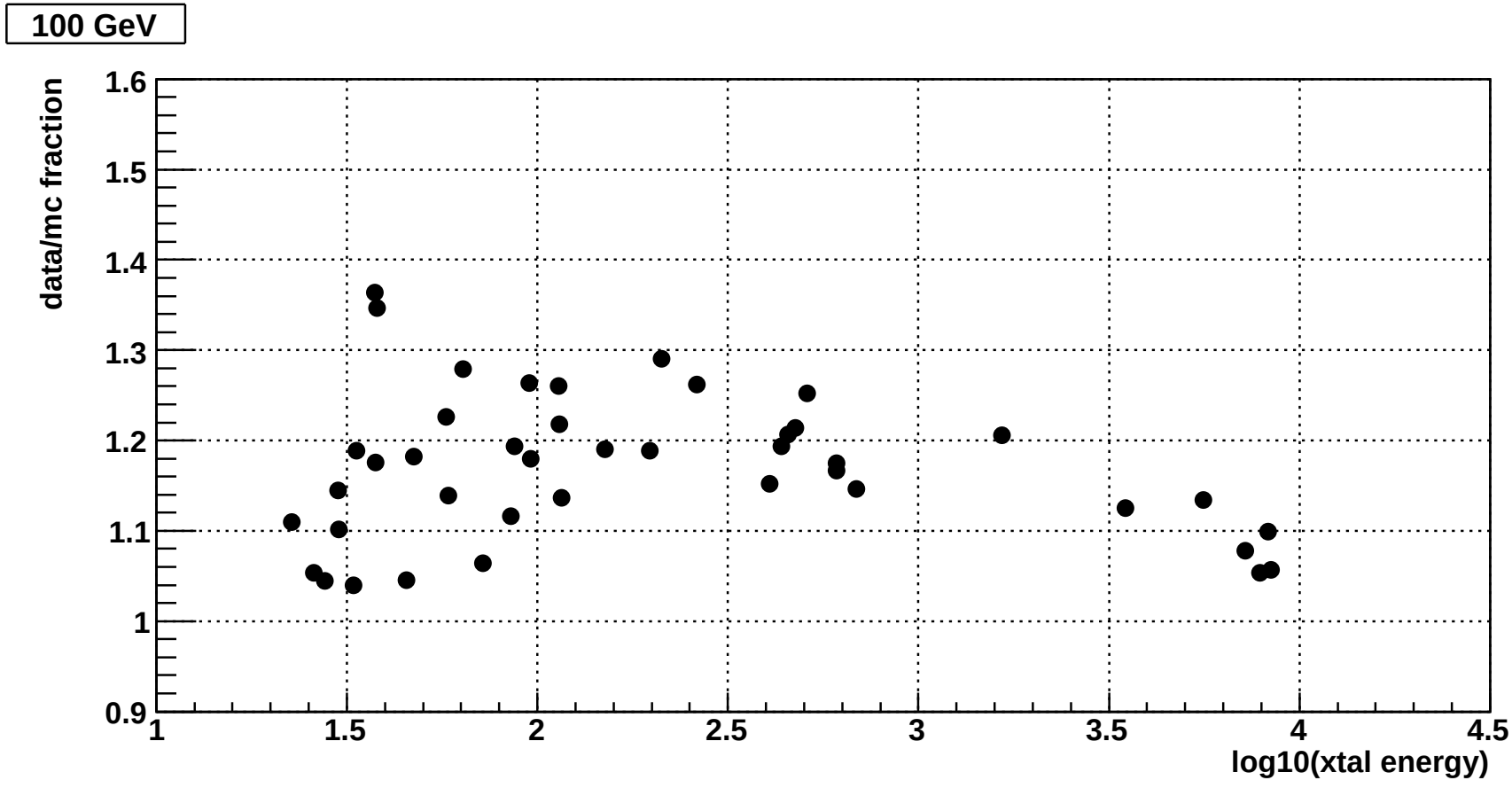
top to bottom : layer 0 to 7

central column :

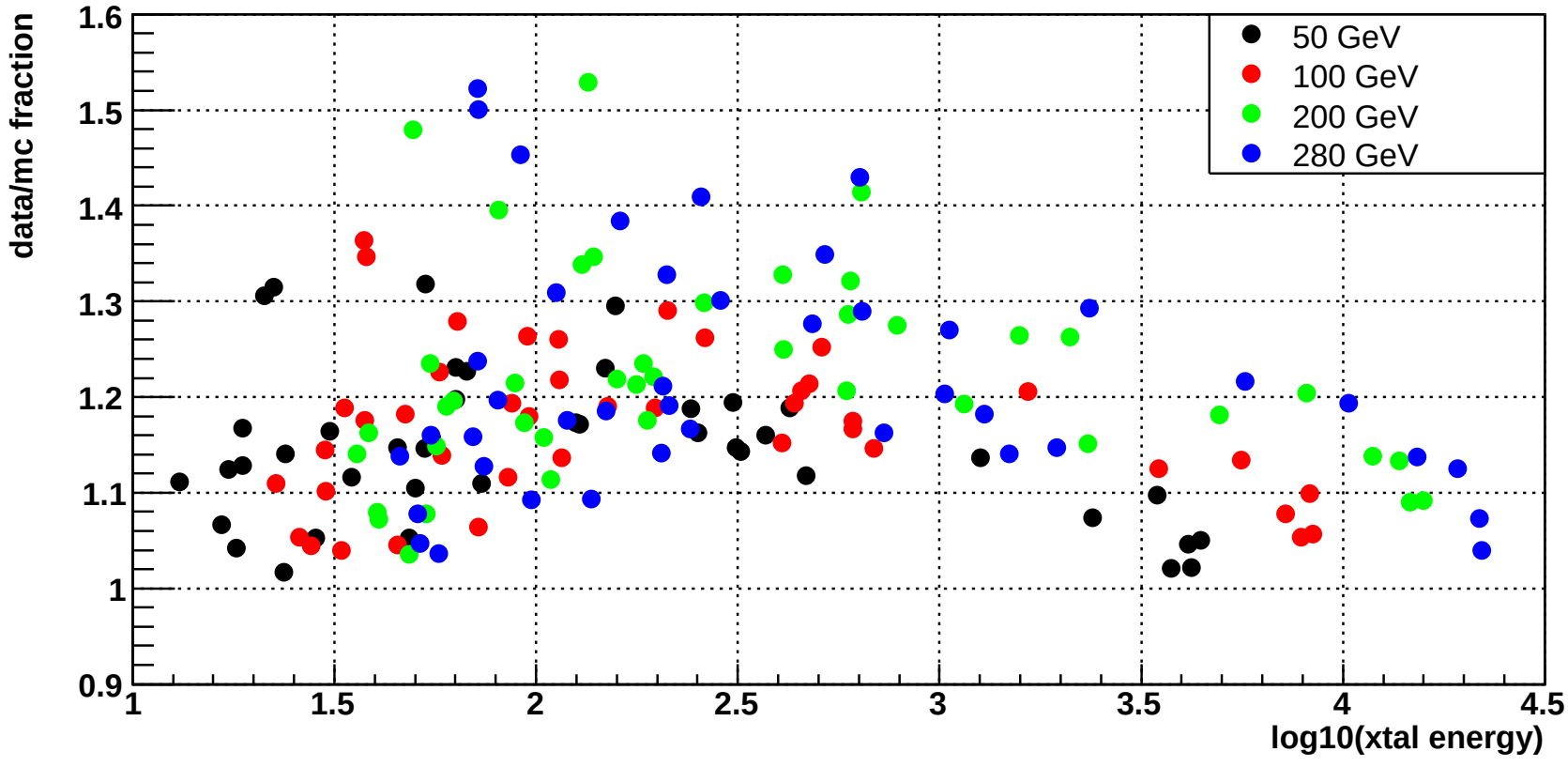
crystals along trajectory

Crystal data/MC fraction 100 GeV

data = run 700002024, MC = Beamtest-0162

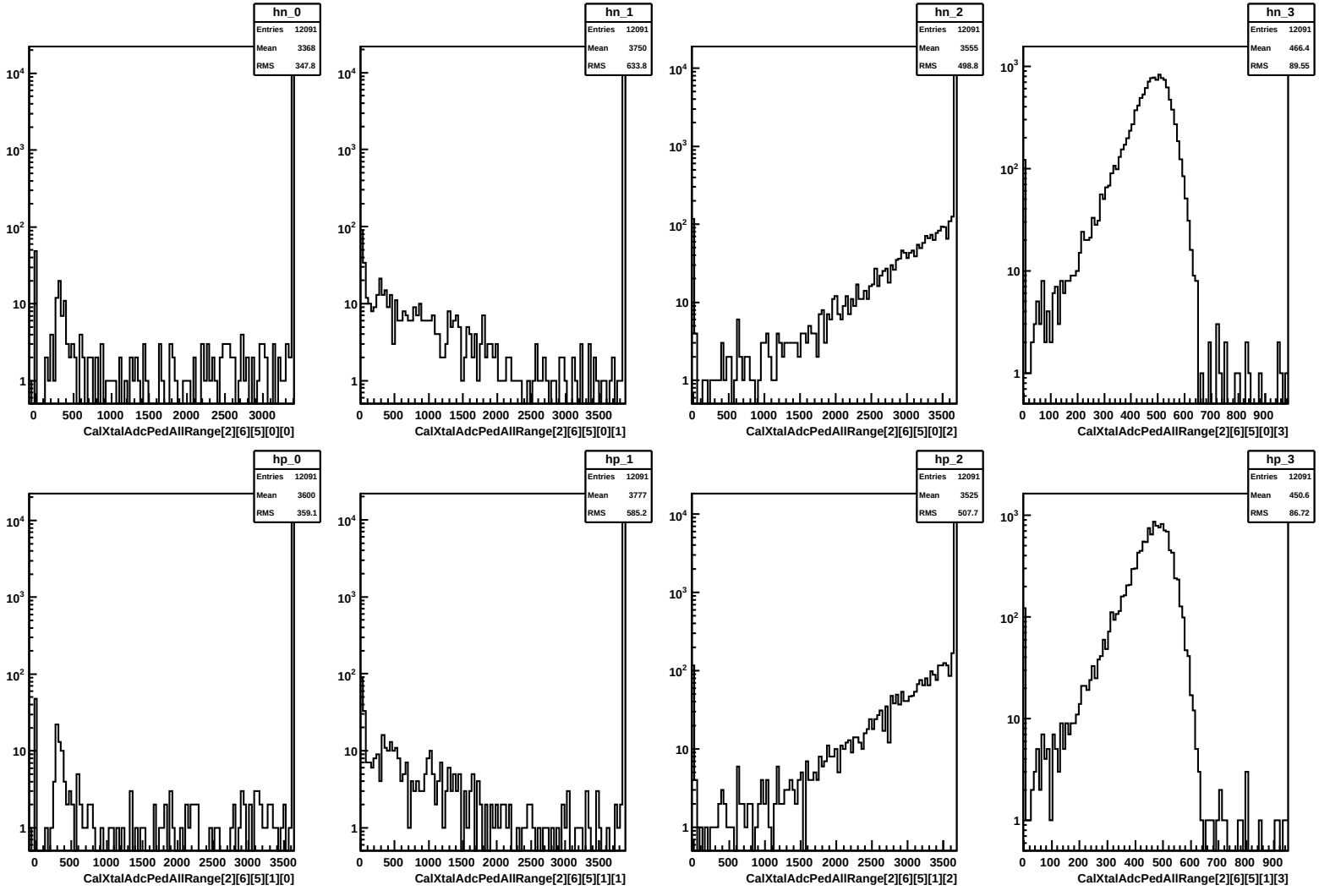


Crystal data/MC fraction



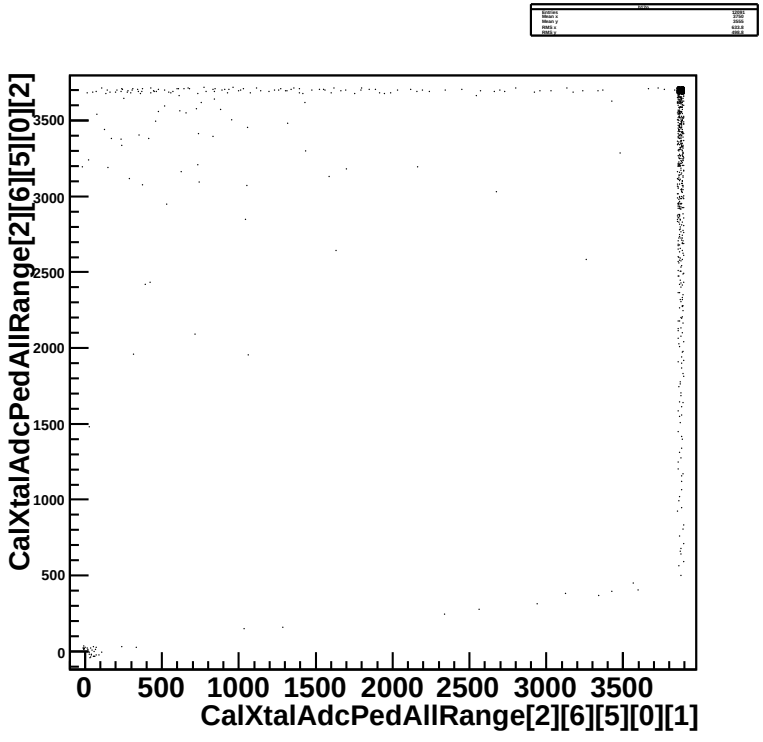
Strange things in the calibration runs

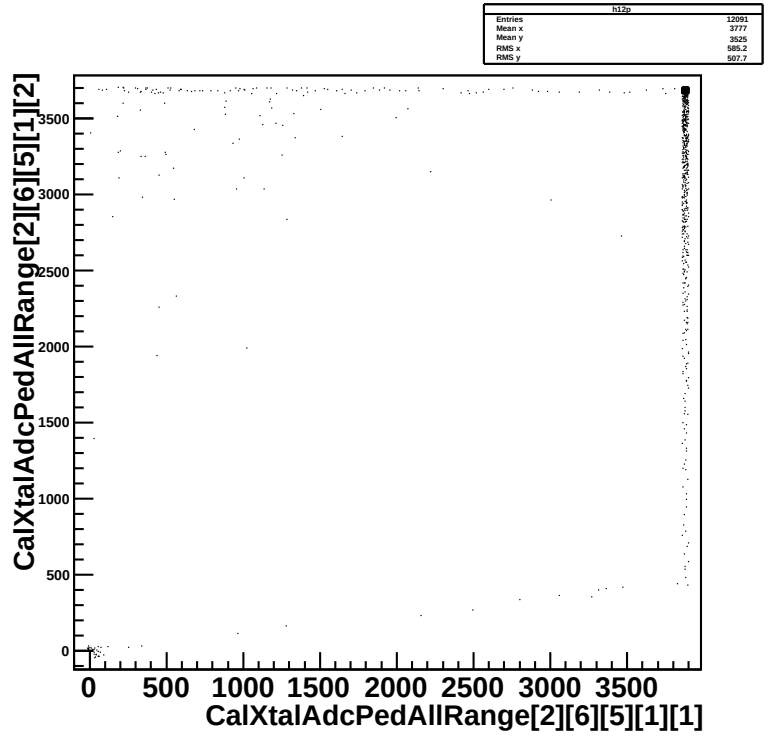
One crystal : tower 2 - layer 6 - log 5 in run 70001795



Strange things in the calibration runs

Some events for which range 2 is saturated and not range 1 !

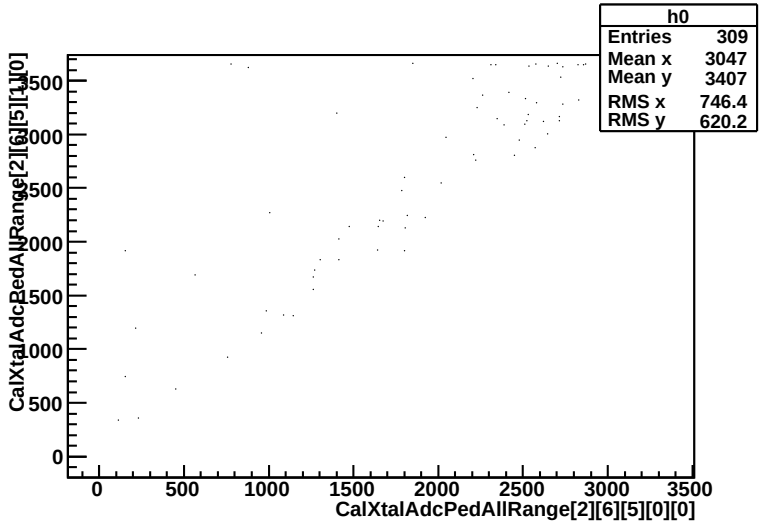


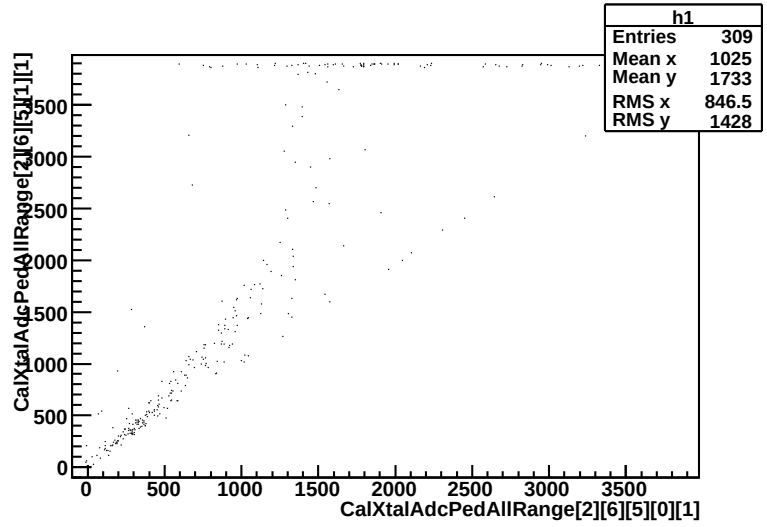


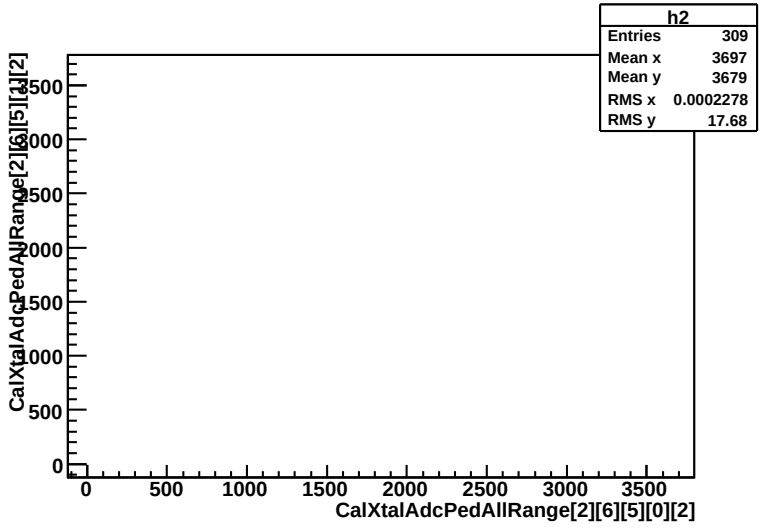
Strange things in the calibration runs

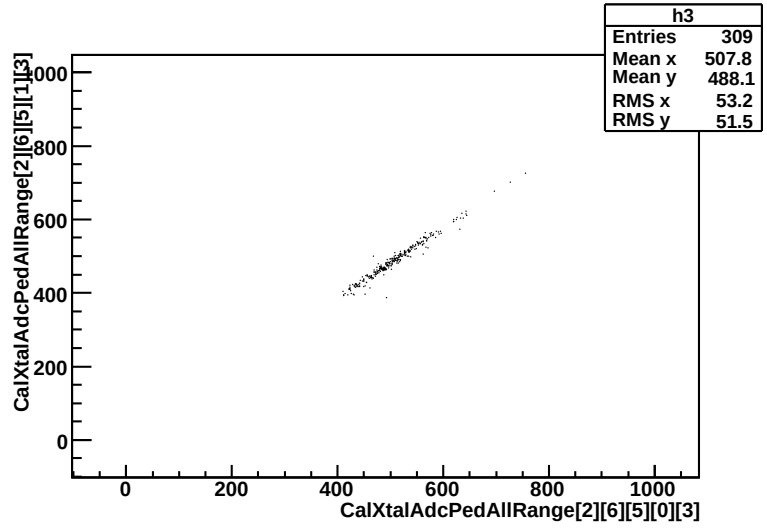
Left and right signals in range 3 are correlated :

it is not due to particles hitting directly the small diode







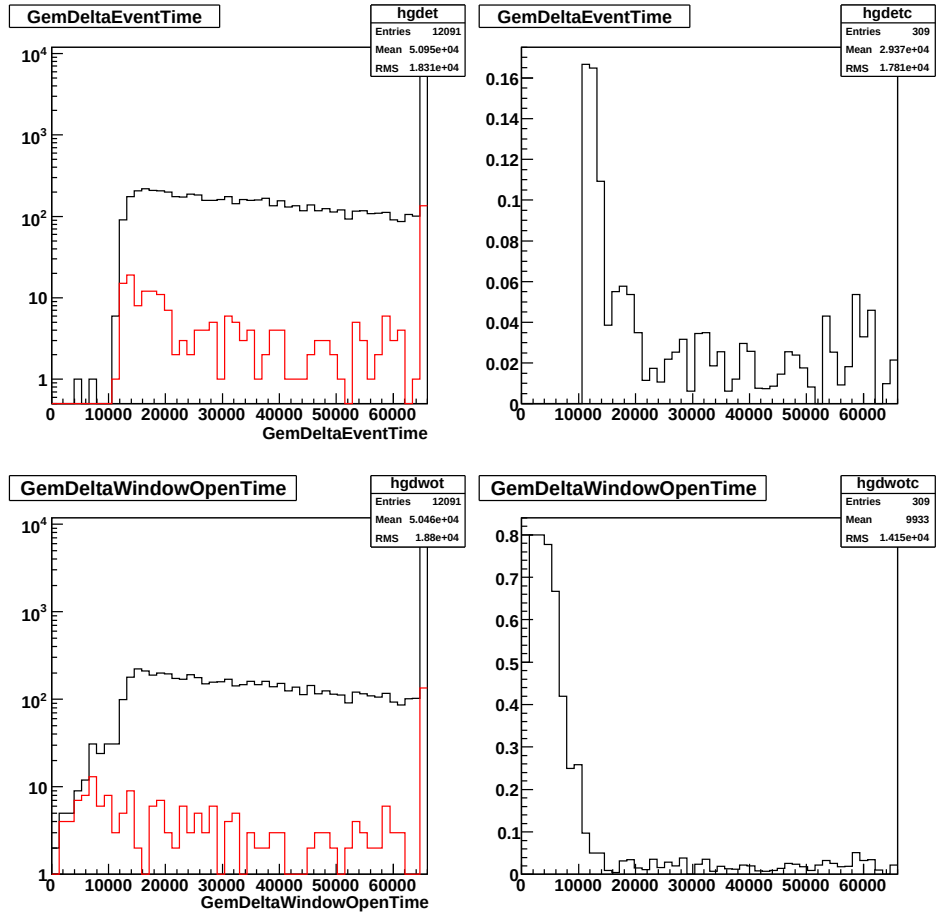


Strange things in the calibration runs

Sasha's explanation : a second particle coming close after the first one

the small diode preamp is already recovered

but the big diode preamp is still saturated

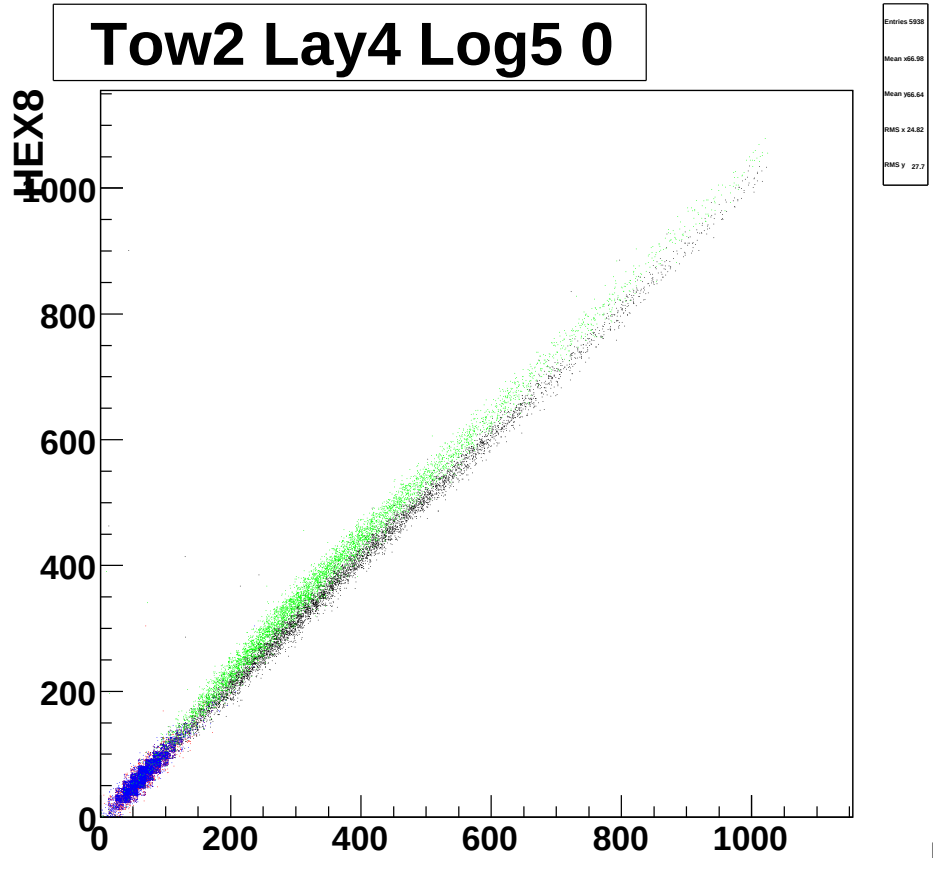


Strange things in the calibration runs

tower 2 - layer 6 - log 5 (700001795 shoots in it)

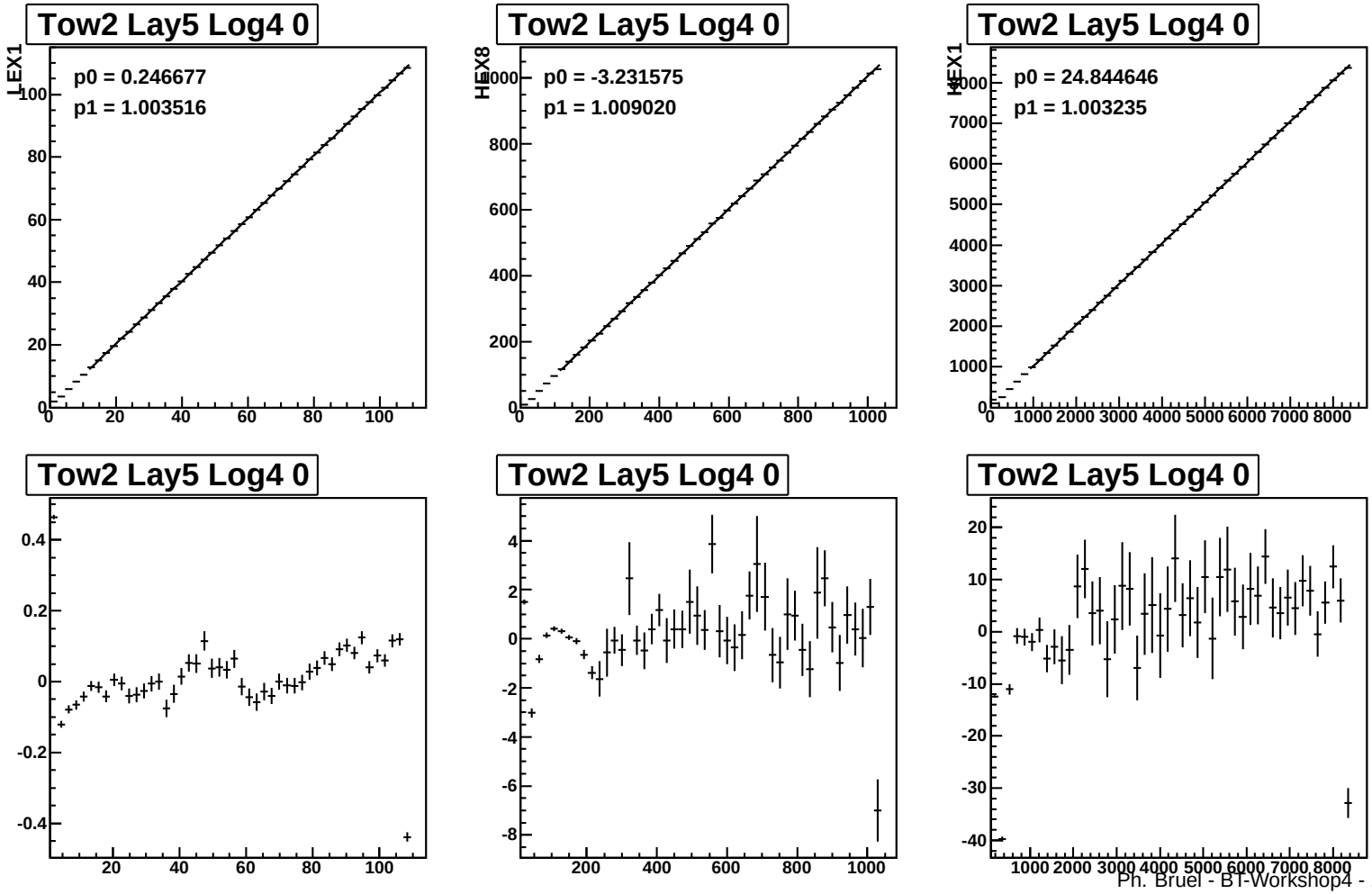
700001792 (red) 1797 (blue) 1794 (black) 1796 (green)

1794 and 1796 should give the same result !



Linearity check

tower 2 - layer 5 - log 4 - side 0



Linearity check

tower 2 - layer 5 - log 5 - side 1