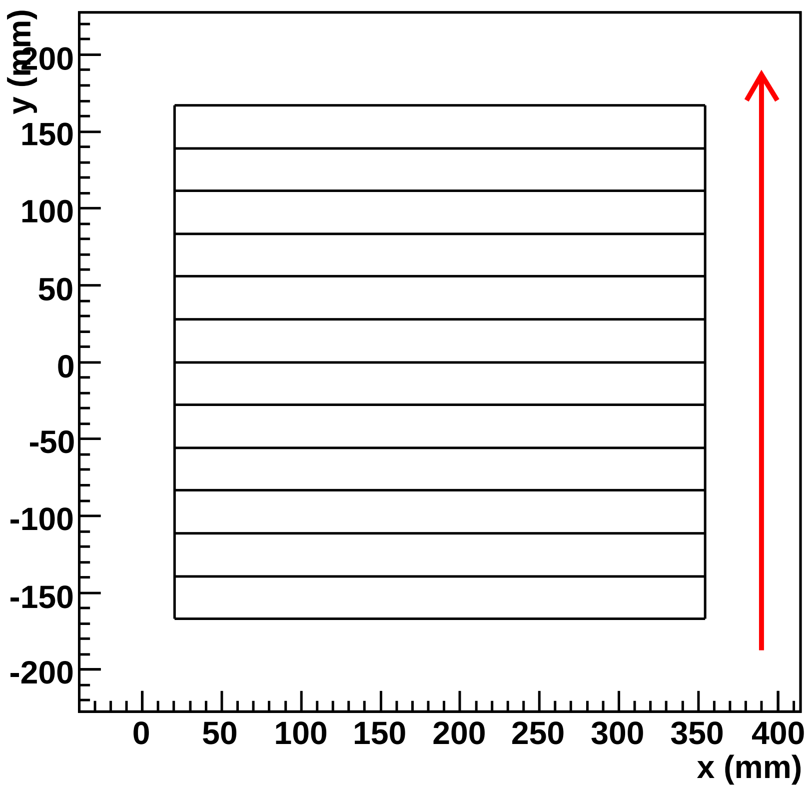
Data/MC detailed crystal comparison

- still trying to understand/qualify/quantify the calibration problem
- we have already compared the total energy and the layer energies between data and simulation
- here is the comparison of the crystals energies

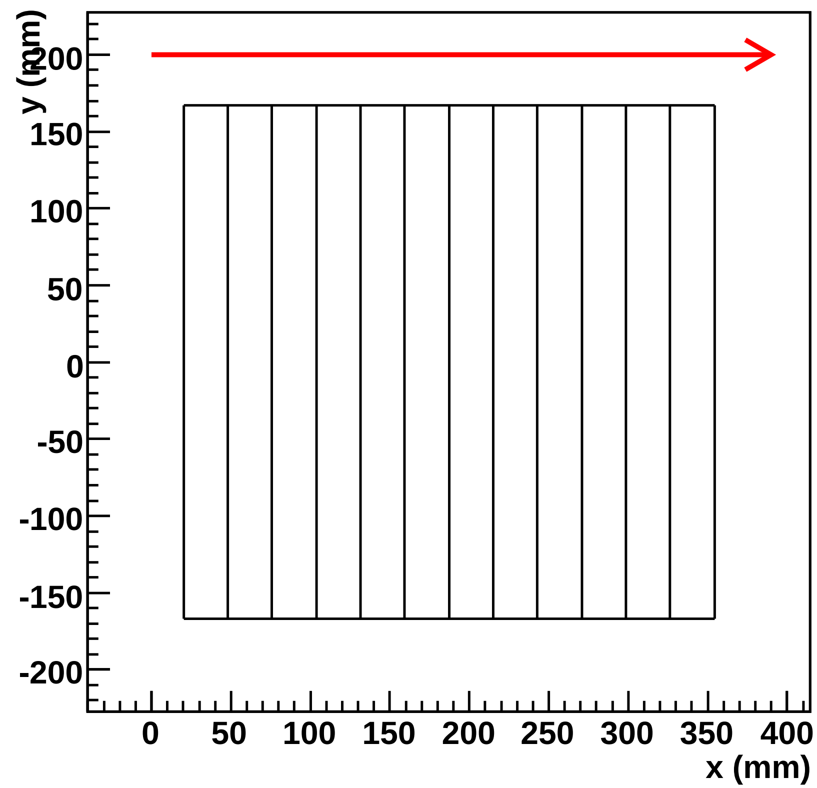
Position dependence

The energy of the crystals depends very much on the impact position of the electron

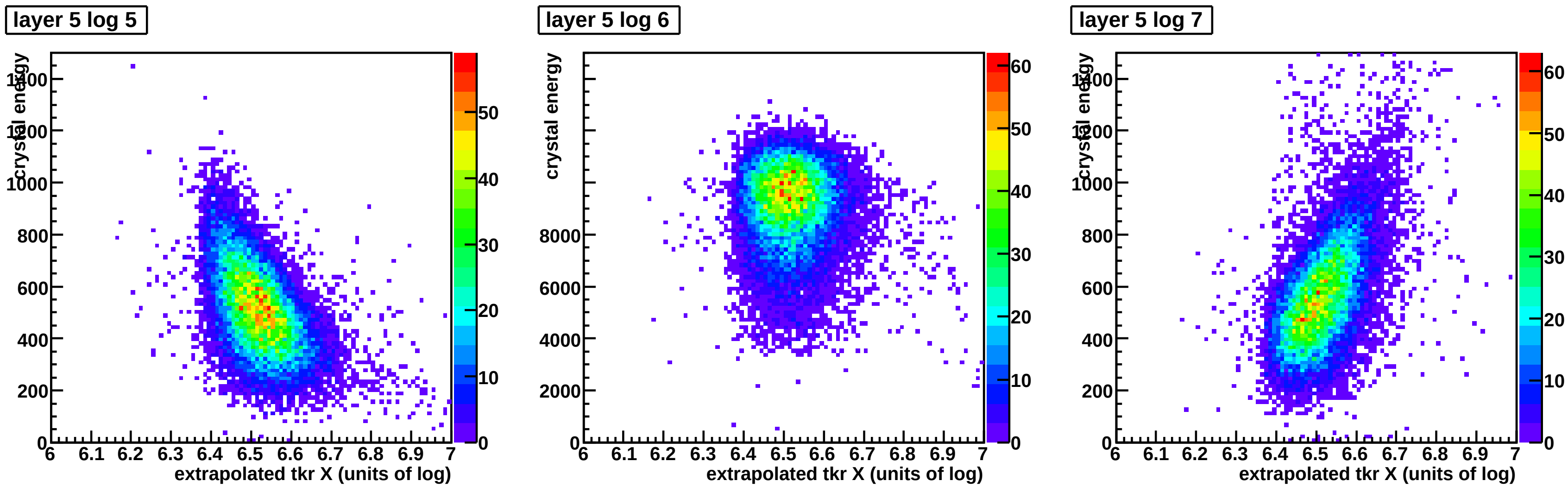
even layer -> Y dependence



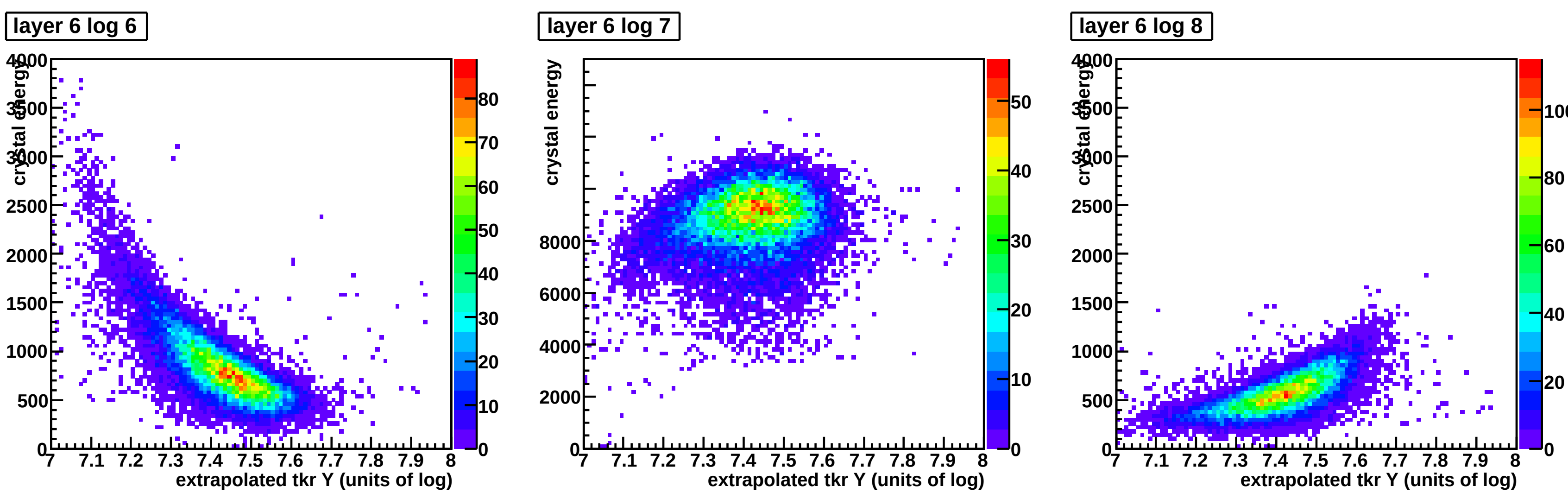
odd layer -> X dependence



layer 5 ⇒ looking at the energy of the crystals versus X



layer 6 ⇒ looking at the energy of the crystals versus Y

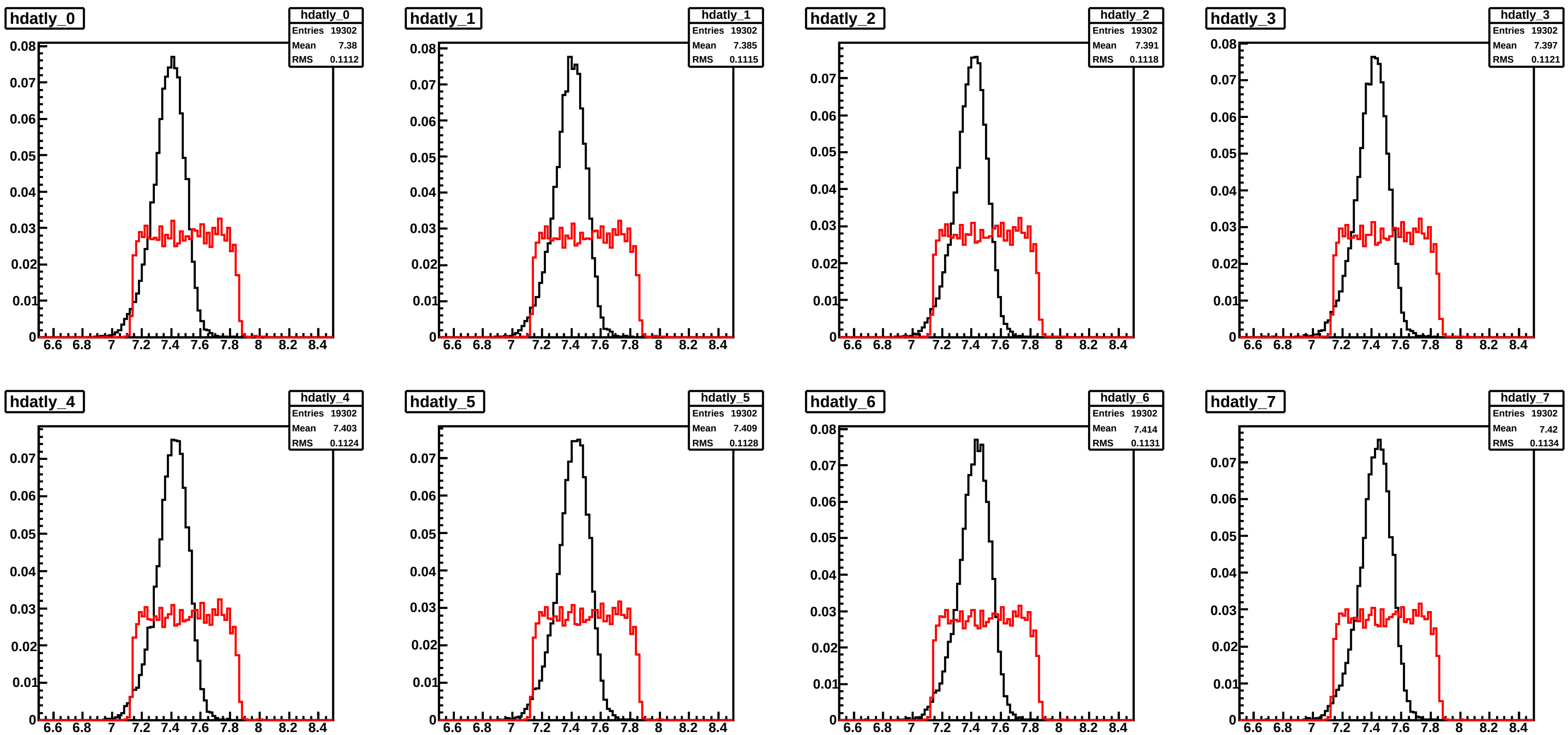


Data/MC comparison

red : MC (Beamtest-0162)

black : run 700002024

determining the common position interval

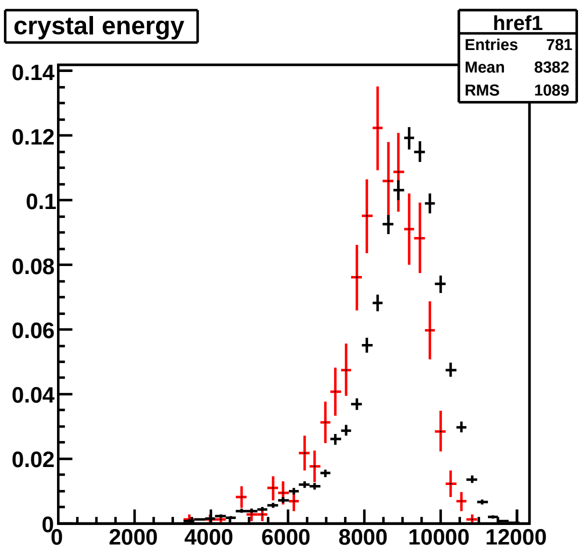


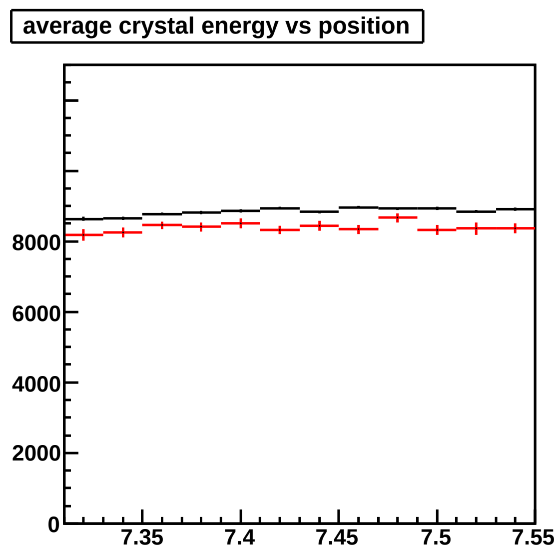
Data/MC comparison

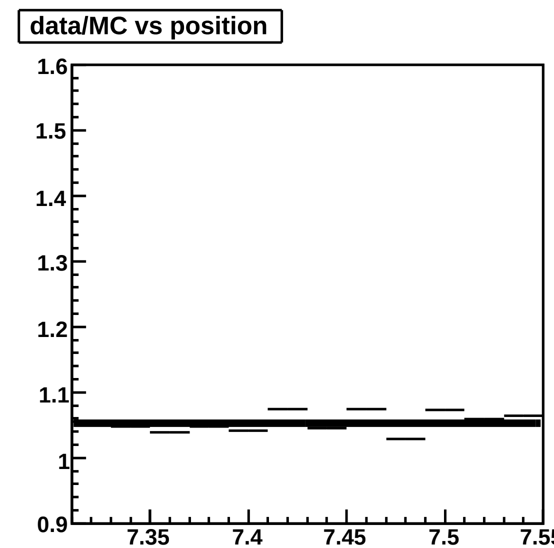
red : MC (Beamtest-0162)

black : run 700002024

determining the fraction of the average energy as function of the position







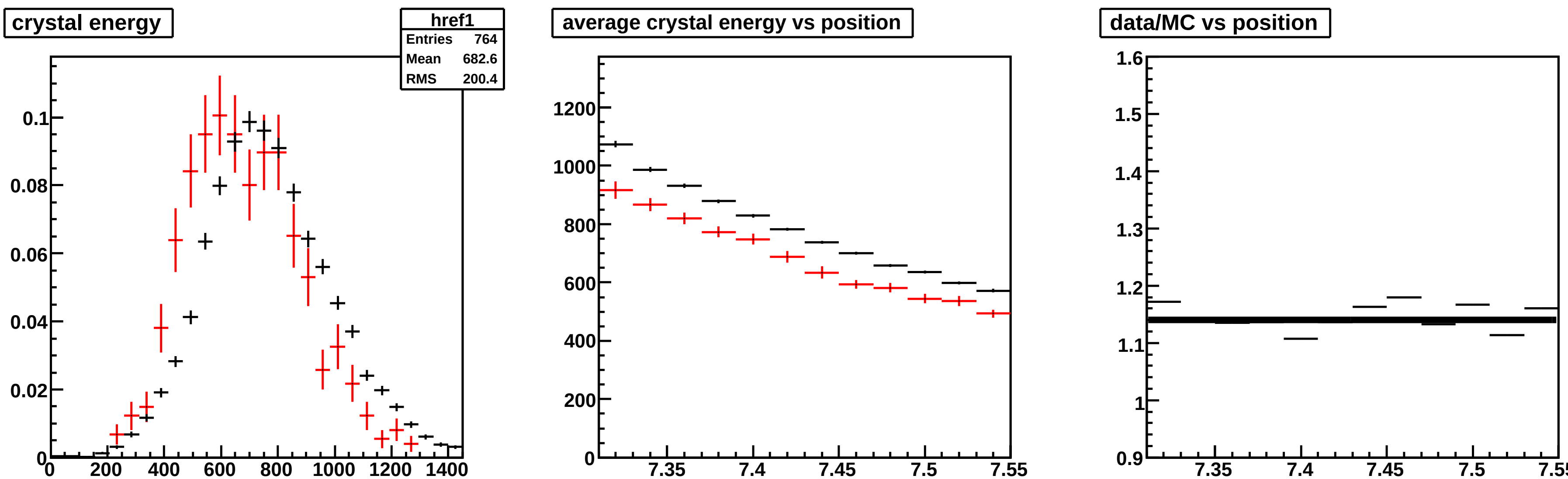
Data/MC comparison

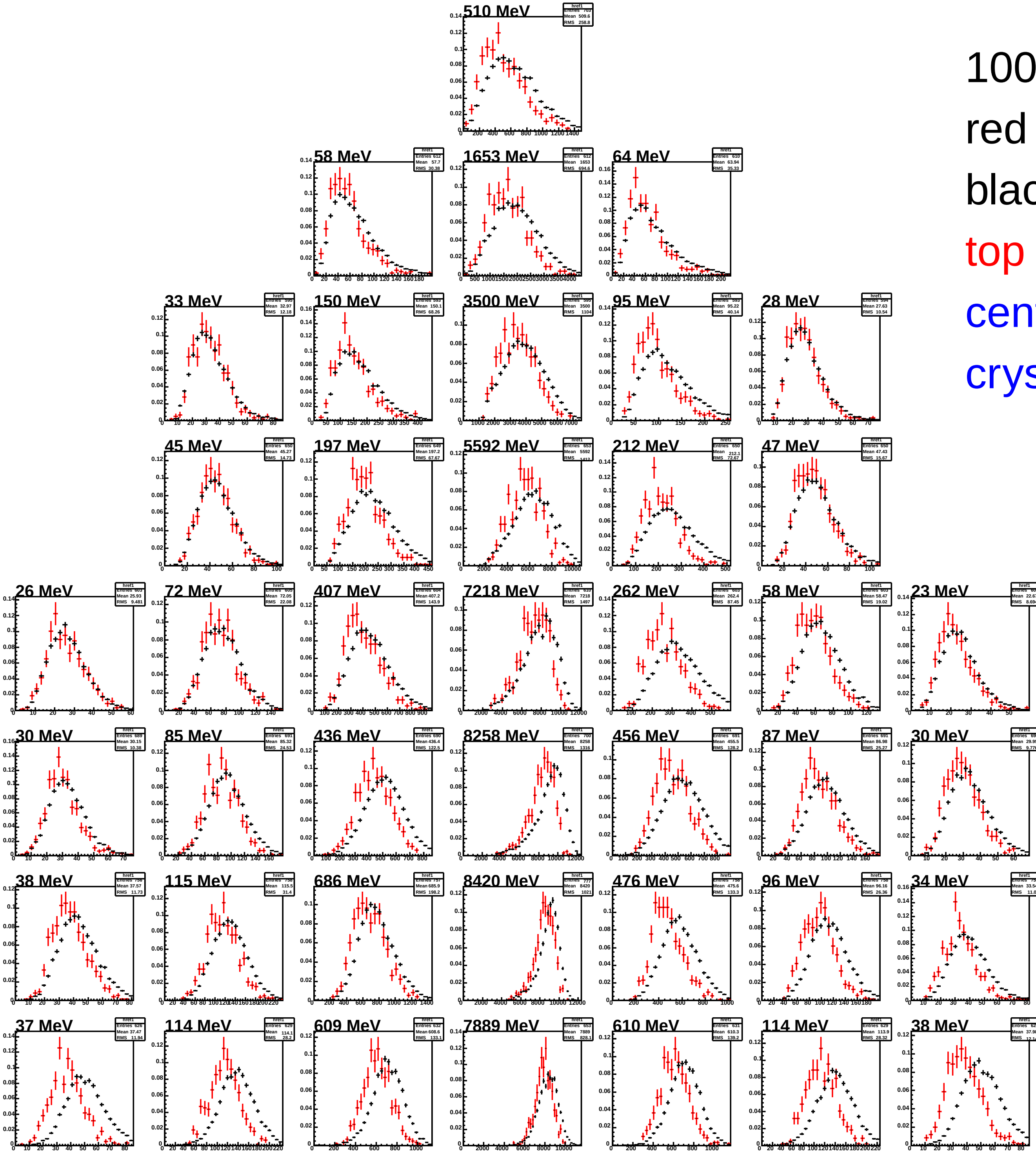
red : MC (Beamtest-0162)

black : run 700002024

when the crystal is not along the electron trajectory, the average energy is not constant anymore

$\Rightarrow$ interesting to check that the fraction data/MC is constant





100 GeV

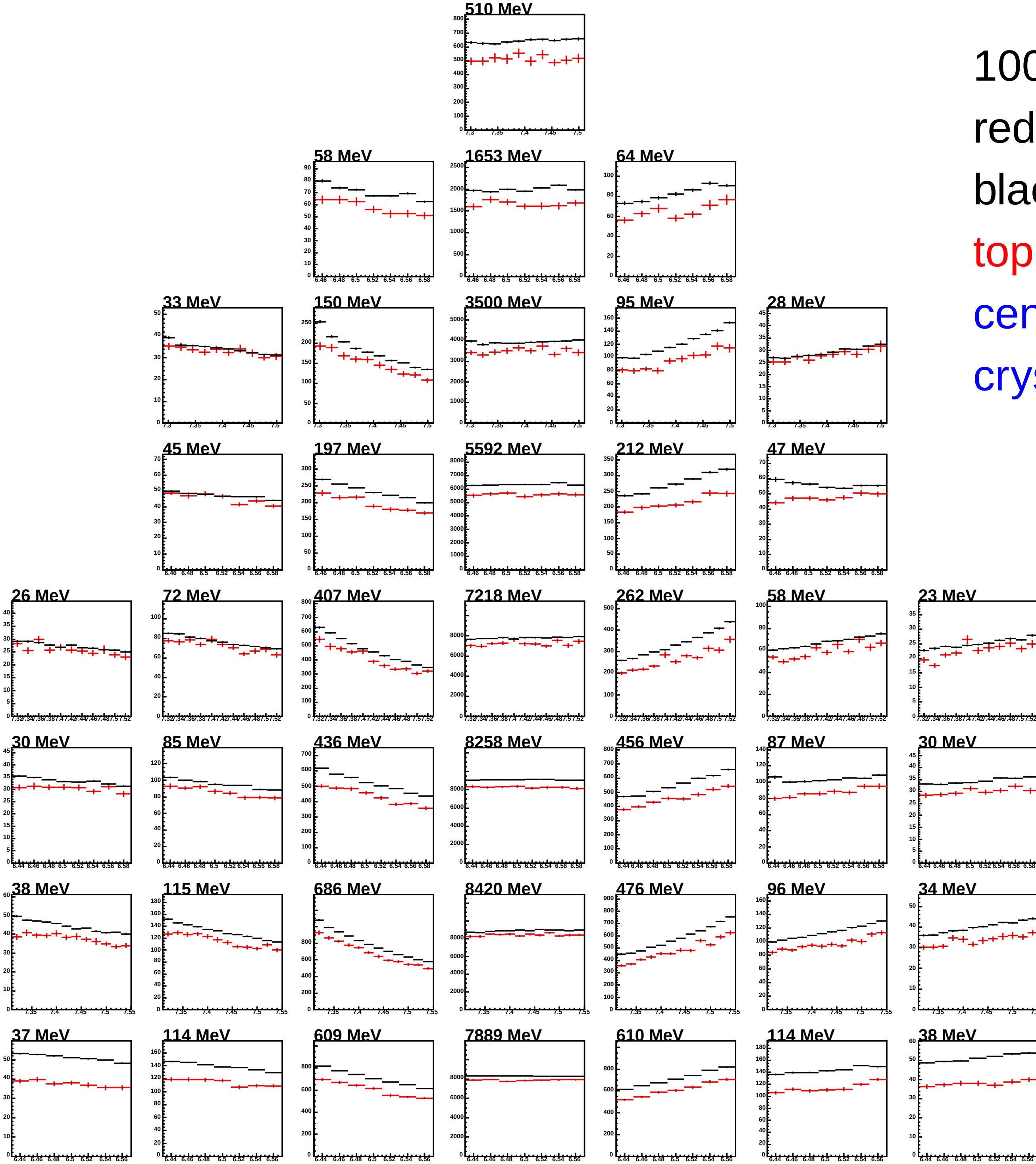
red : MC (Beamtest-0162)

black : run 700002024

top to bottom : layer 0 to 7

central column :

crystals along trajectory



100 GeV

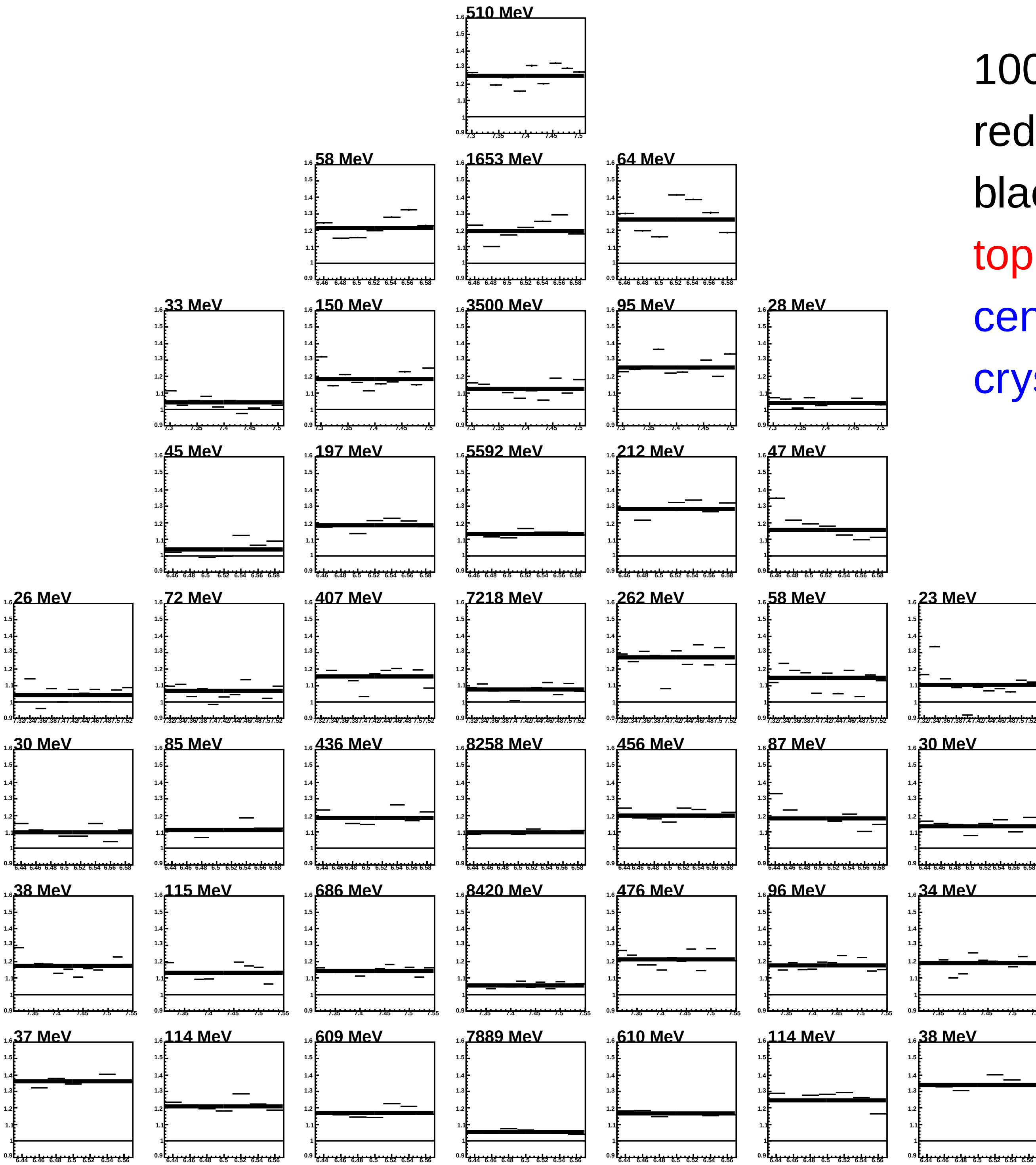
red : MC (Beamtest-0162)

black : run 700002024

top to bottom : layer 0 to 7

central column :

crystals along trajectory



100 GeV

red : MC (Beamtest-0162)

black : run 700002024

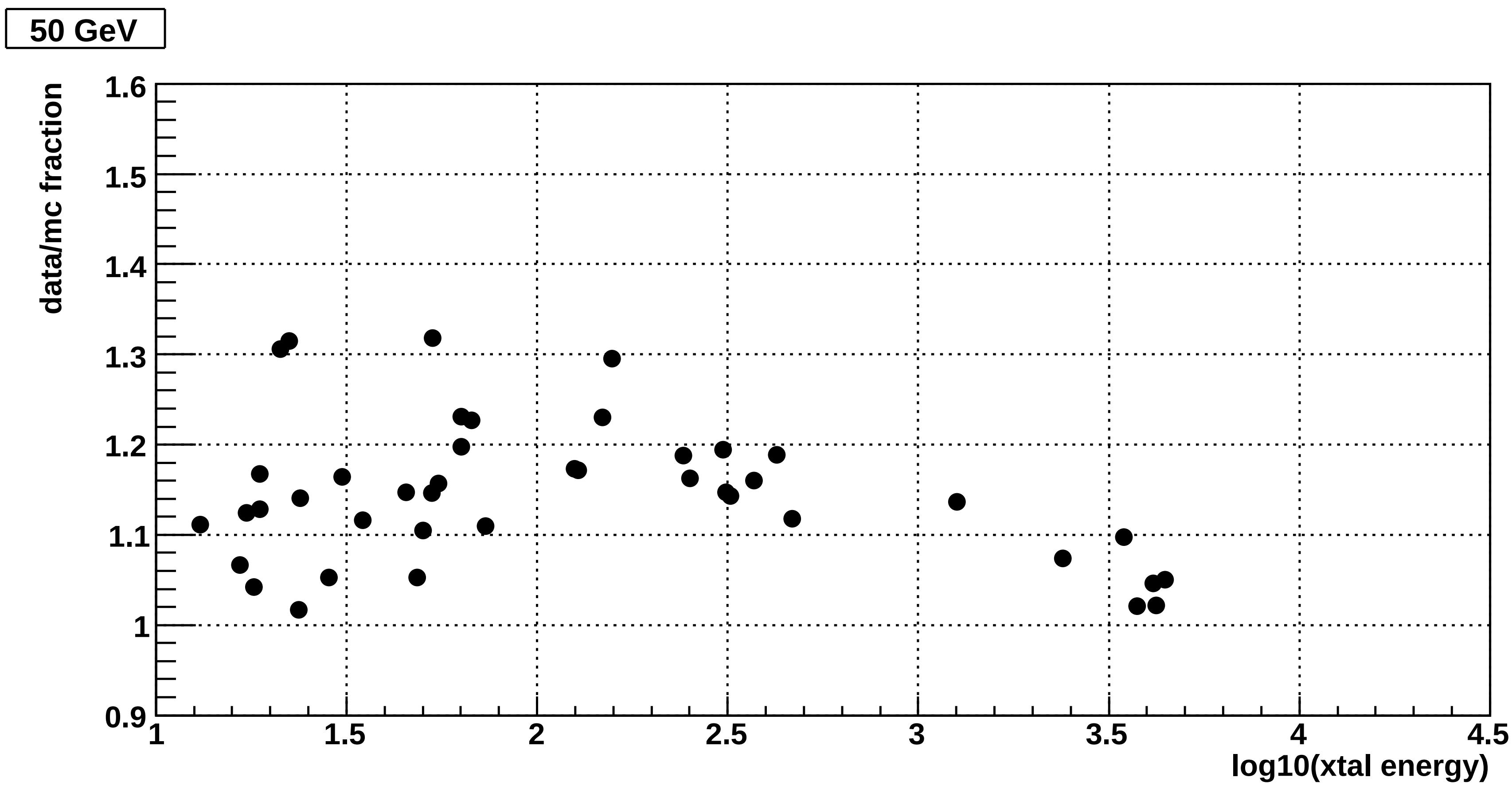
top to bottom : layer 0 to 7

central column :

crystals along trajectory

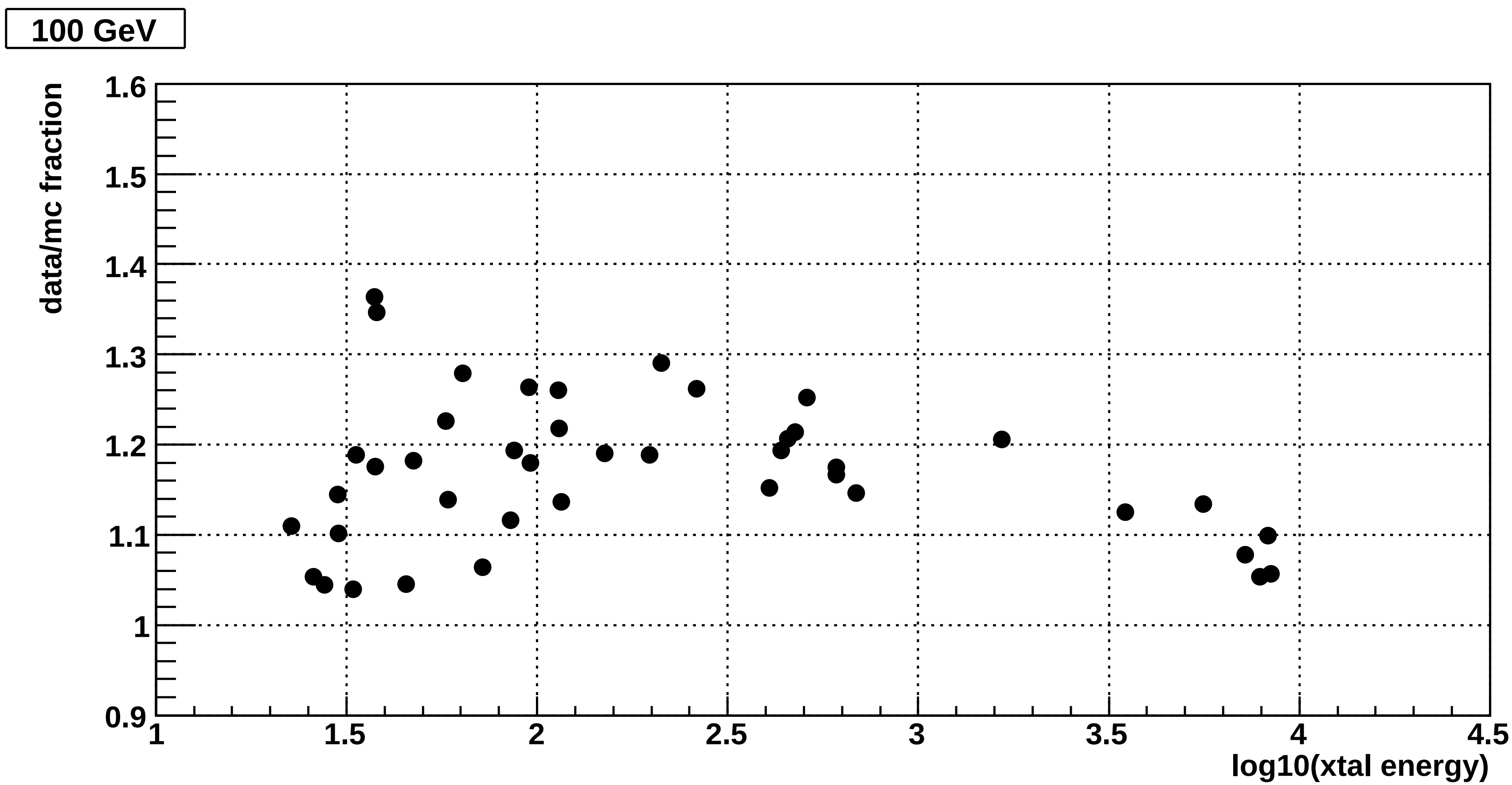
Crystal data/MC fraction 50 GeV

data = run 700002039, MC = Beamtest-0172



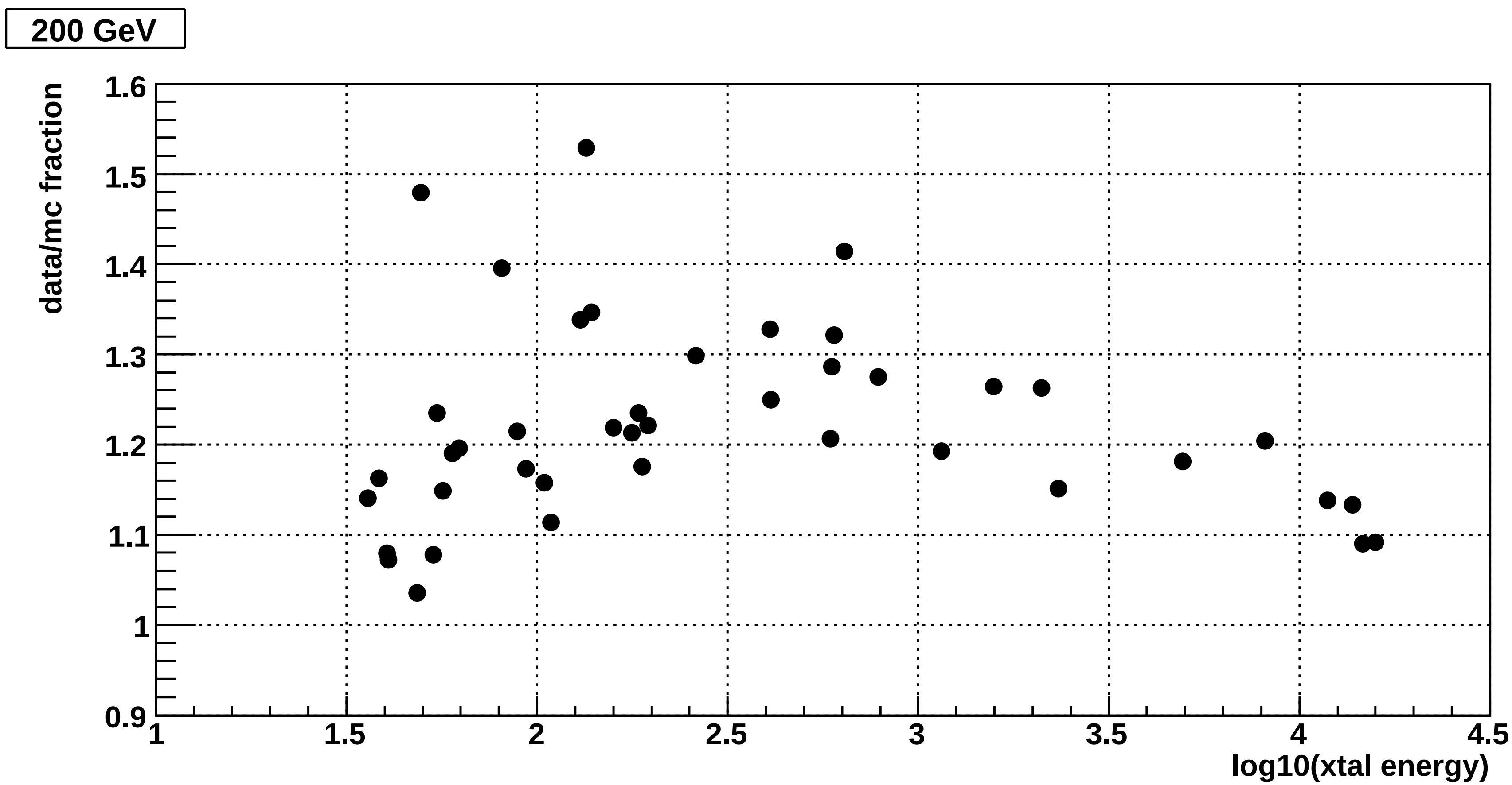
Crystal data/MC fraction 100 GeV

data = run 700002024, MC = Beamtest-0162



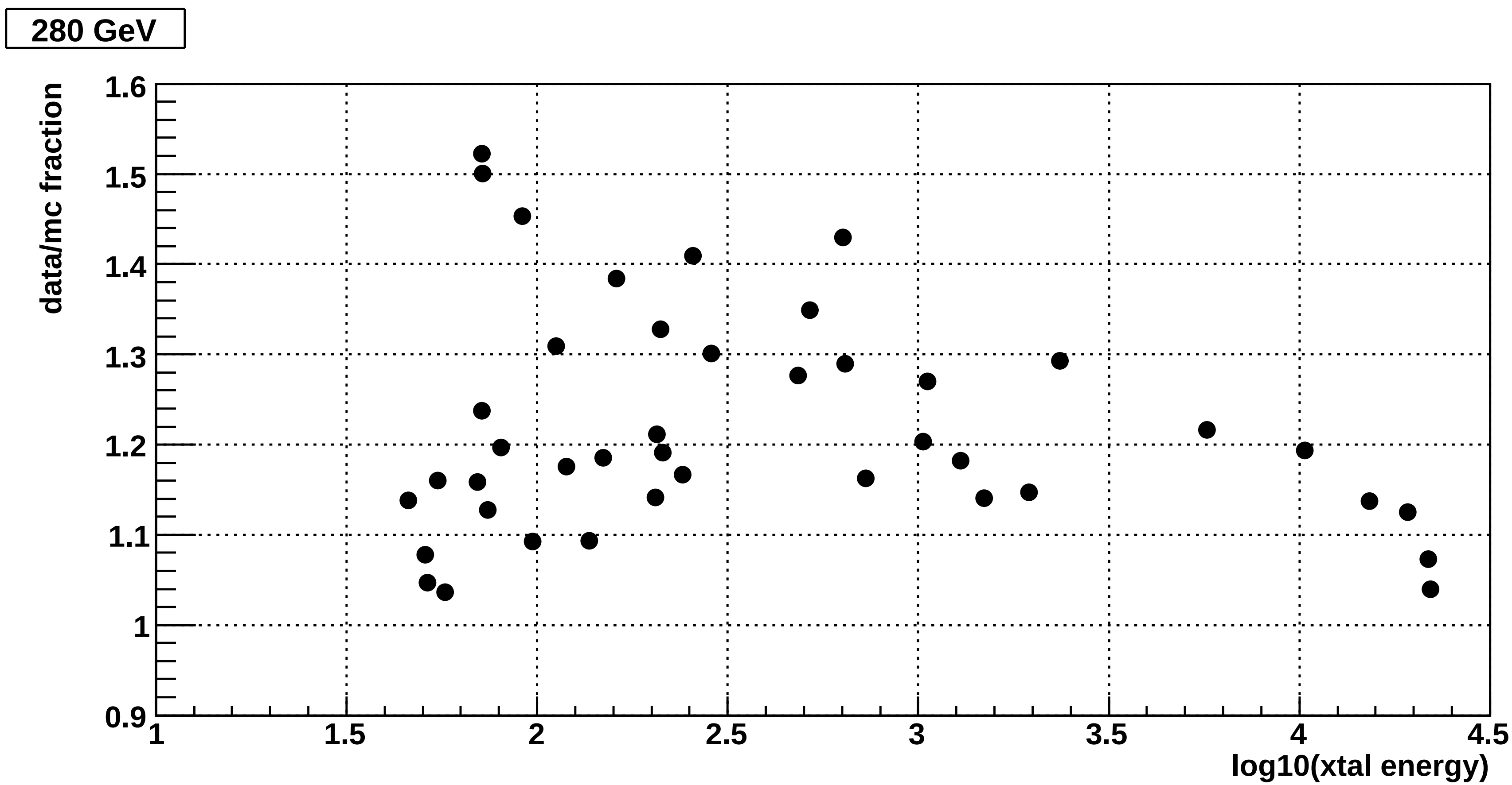
Crystal data/MC fraction 200 GeV

data = run 700001911, MC = Beamtest-0164

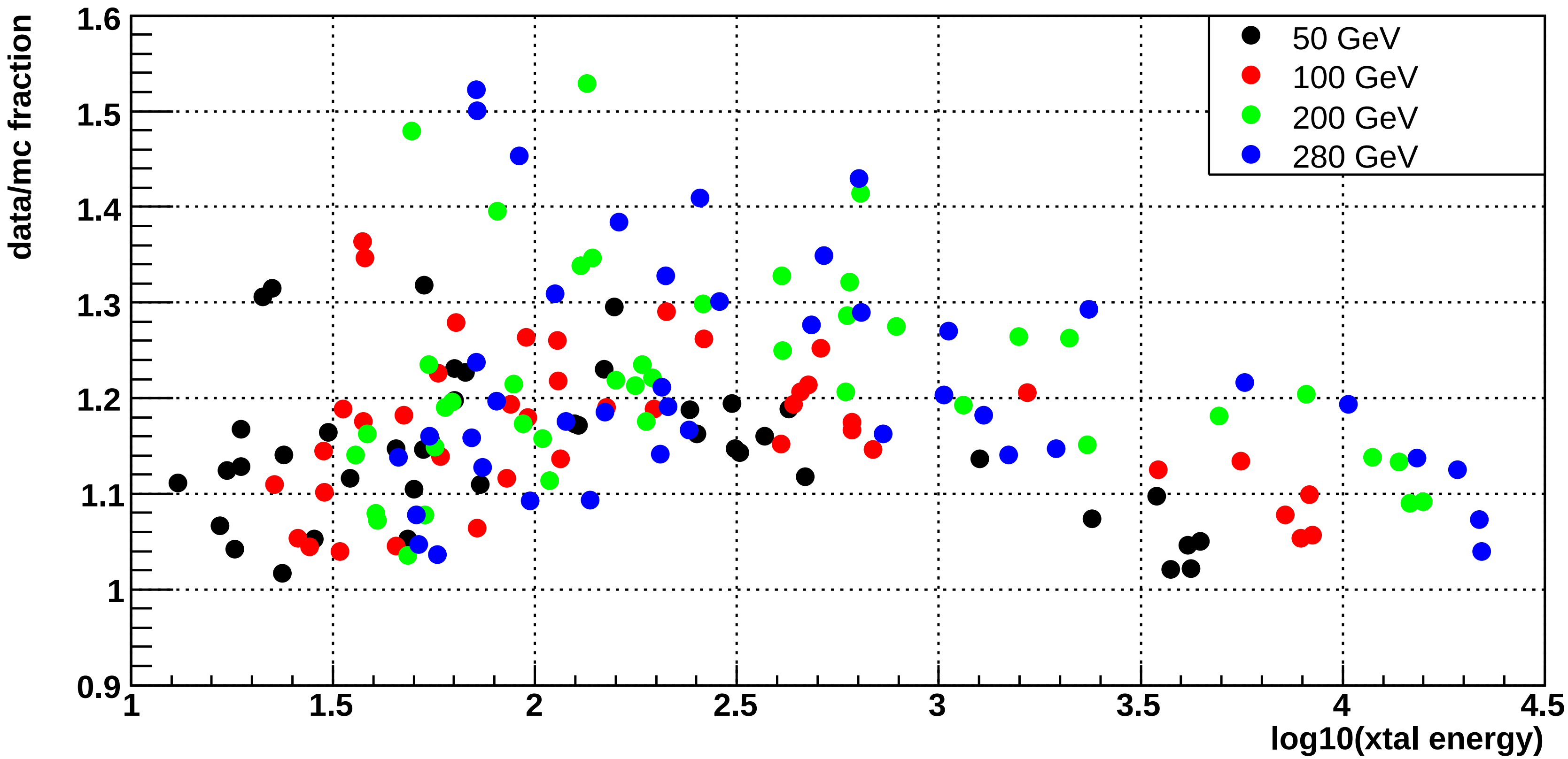


Crystal data/MC fraction 280 GeV

data = run 700001922, MC = Beamtest-0166



Crystal data/MC fraction



Conclusions

- the data/MC fraction versus log10(energy) exhibits a clear trend
- but :
  - it is not an exact relation
  - it varies with beam energy
- compatible with scintillation effect ?
  - the triggers/spill is 1000 evts for 50, 100, 200 GeV and 500 evts for 280 GeV
  - the data/MC fraction versus log10(energy) should be exactly the same at least for 50, 100 and 200 GeV