

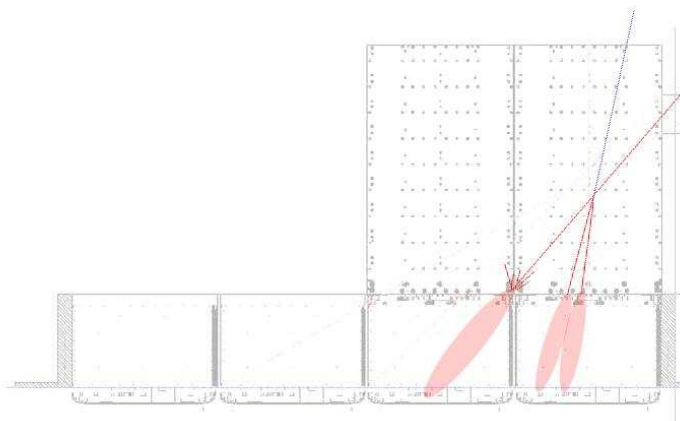
GLAST CERN 2006 Beamtest



TKR HoneyComb and CAL energy GEANT4 Standalone

Johan Bregeon (INFN-Pisa)

Beamtest Analysis - April 4th, 2007



idea

- In official geometry, TKR honeycomb is currently described as an homogeneous Al volume with reduced density.
- Is that correct ?
 - one can *imagine* a particle than would go through a honeycomb cell wall (2.8cm of Al) in one of the many trays and see much more material than what we simulate
 - ⇒ Can using the correct honeycomb geometry, solve our CAL energy problems ?

GEANT4 Standalone : TKR + CAL

TKR

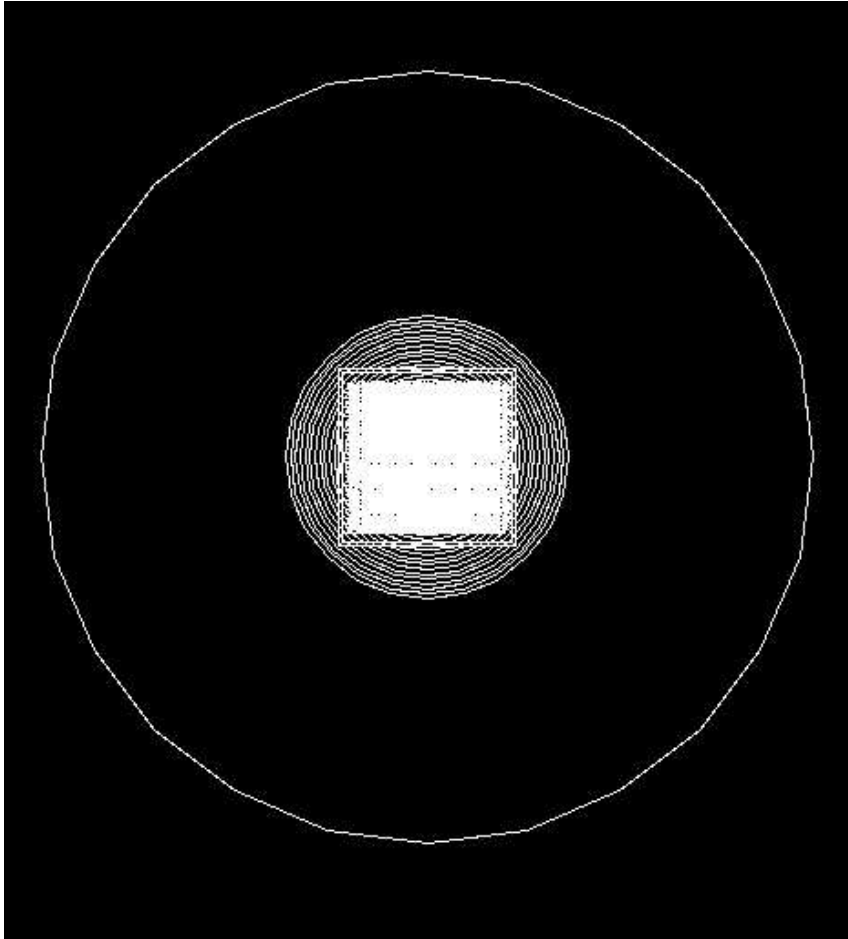
- CU Tracker Tower: 19 Trays (Si+HoneyComb+W+Si)
 - △ Realistic Al HoneyComb (TKR)
 - △ Homogeneous Al plate HoneyComb (TKRSmooth)
 - △ No Honeycomb
- Aluminium plate: iX0 with $i=1.3, 1.4, 1.5, 1.6$

CAL: Philippe cylindrical geometry

- 40 Layers : $0.25\text{cm} * \text{CsI} * 40 = 10\text{X0}$
- 30 Cylinders : 50cm in diameter

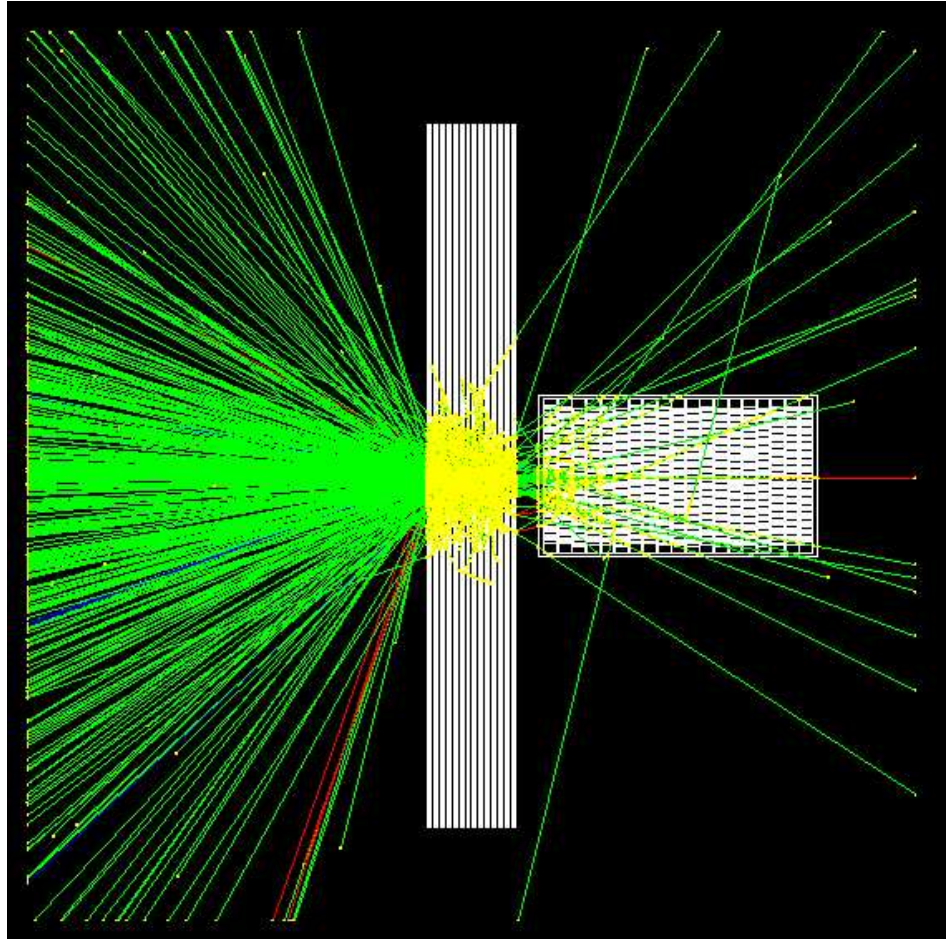
→ may be I should do it bigger...

geometry - front



- TKR is square and CAL is cylindrical
- CAL is much larger than TKR
- TKR Honey-Comb are randomly shifted in each tray

10GeV electrons



- shower not contained at 10GeV
- trays could be more detailed (segmented Si, W)
- **no information** is gathered for what happens in the TKR

Configurations run

Energy/Particle

- 10GeV electrons

Beam spot

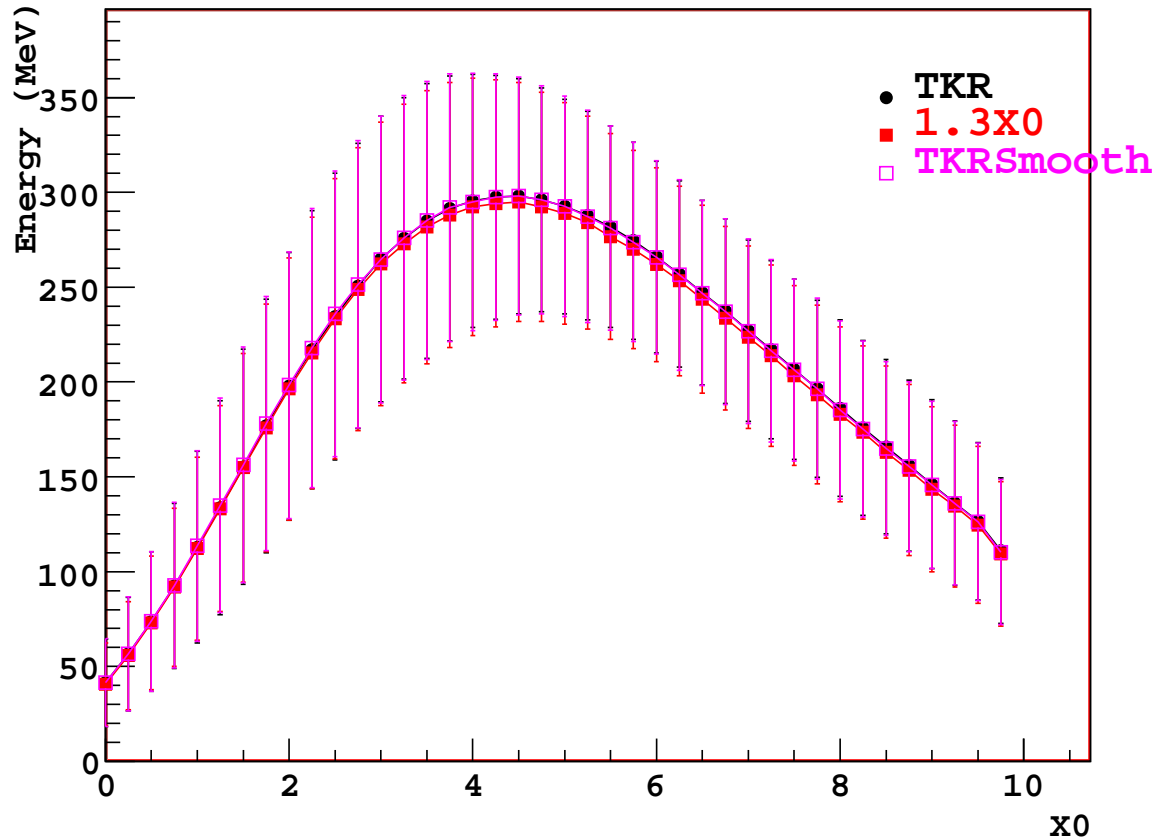
- Small : $3mm \times 3mm$ uniform, 0° , no divergence
- Big : $5cm \times 5cm$ uniform, 0° , no divergence
- gaussian

TKR

- 19 trays with realistic/homogeneous honeycomb
- Al plates : 1.3X0, 1.4X0, 1.5X0, 1.6X0

10GeV electrons - big beamspot

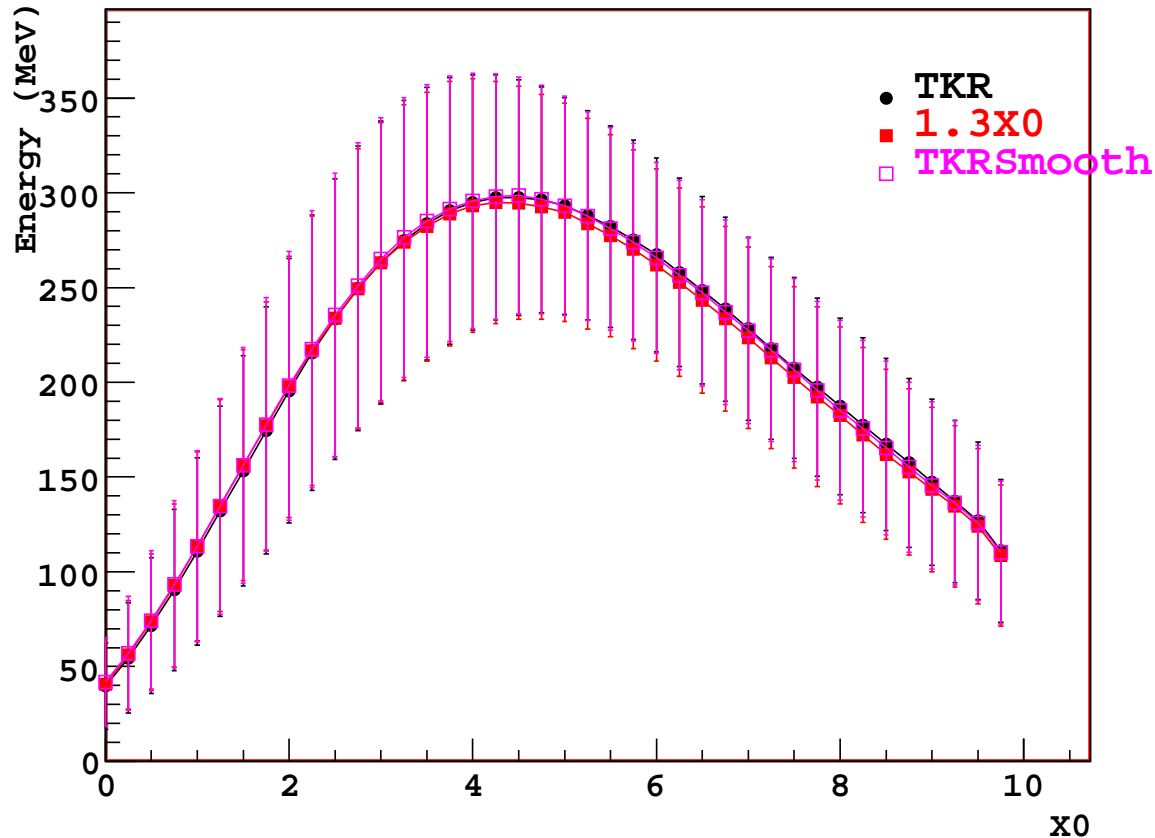
e10GeV_TKR



- my current TKR seems to be $\sim 1.3X0$
- no differences between realistic/homogeneous honeycomb

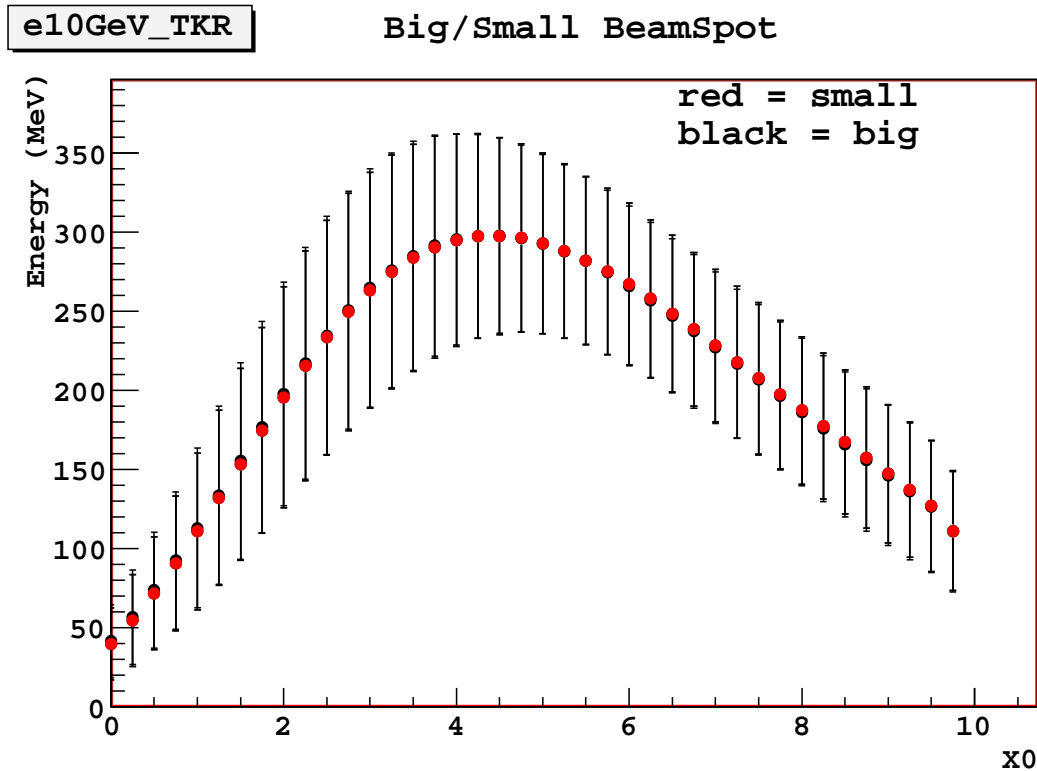
10GeV electrons - small beamspot

e10GeV_TKR



- my current TKR seems to be $\sim 1.3X0$
- no differences between realistic/homogeneous honeycomb

10GeV electrons - small beamspot



- my current TKR seems to be $\sim 1.3X0$
- no differences between realistic/homogeneous honeycomb
- same as for big beamspot

preliminary conclusions

- no significant differences seen so far
- try at angles with beam divergence
- try higher energies

Coming next

Beam spot

- small angle: $\sim 0.5^\circ$ as in data
- divergence
- gaussian

Energy

- higher: 50GeV - 100GeV
- lower: 2.5GeV - 5GeV

Other

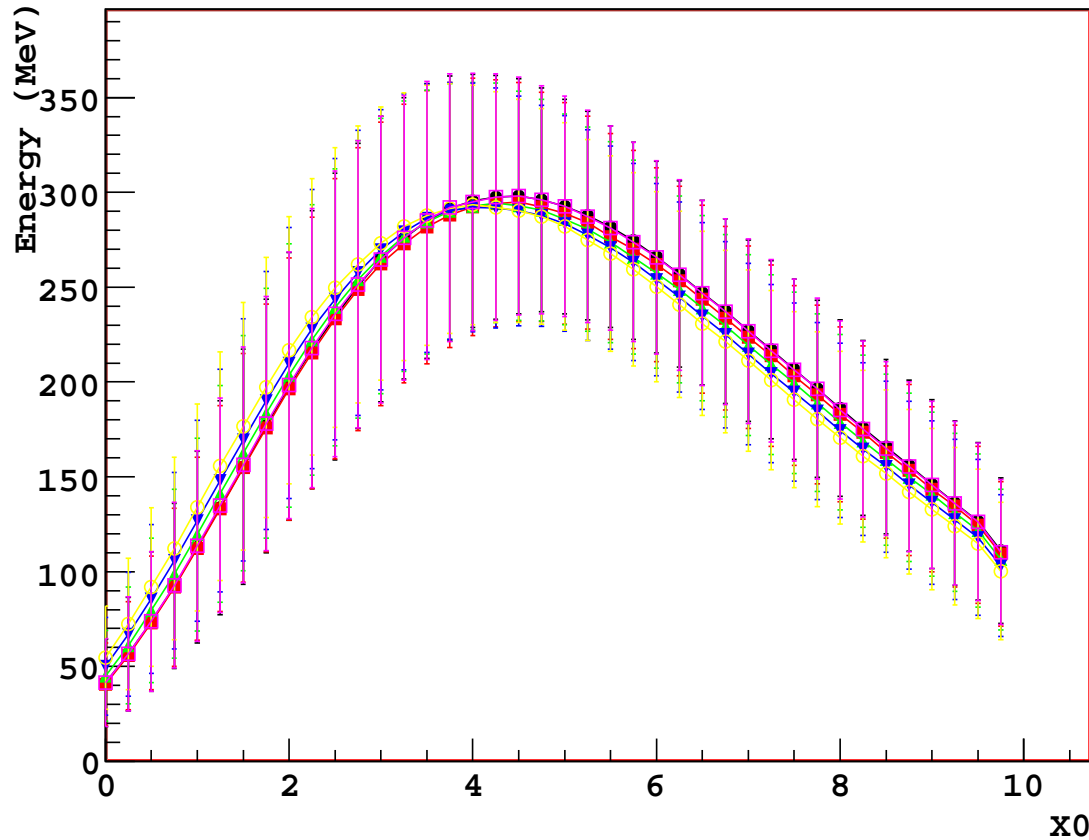
- protons ?
- study Si hits ?

spare

all the profiles for 1.3X0 to 1.6X0 in 2 following slides

10GeV electrons - big beamspot

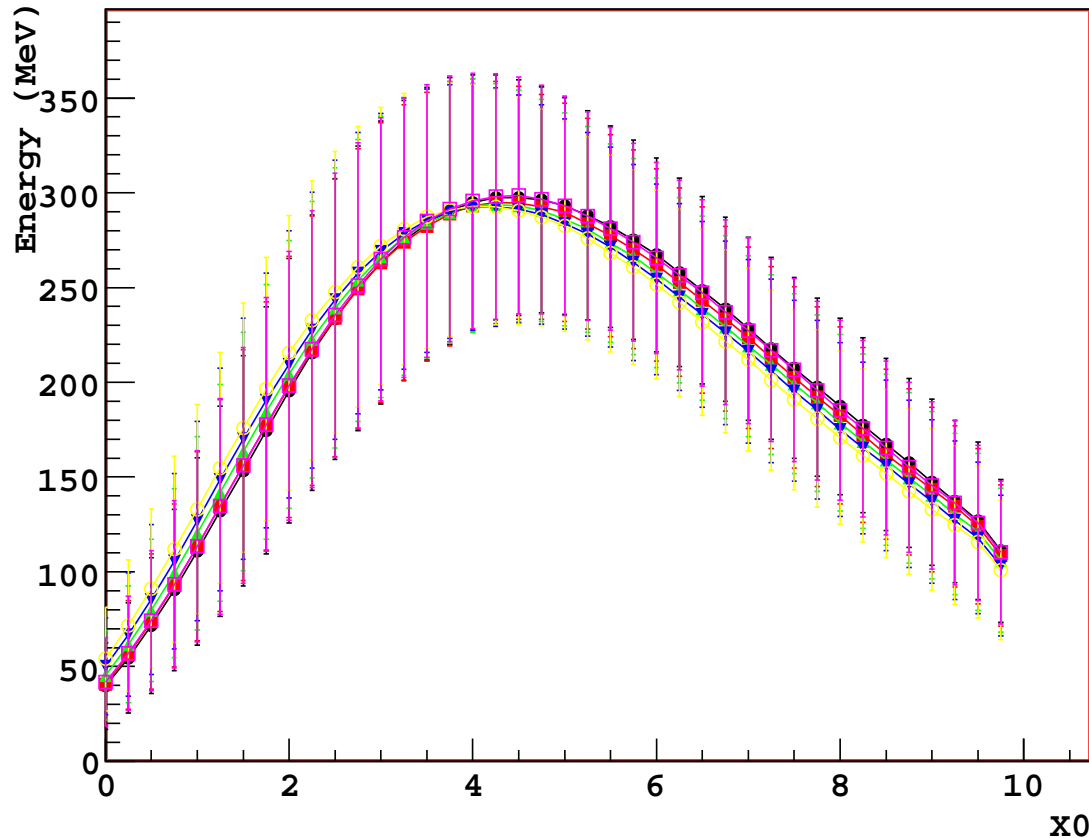
e10GeV_TKR



- 1.3X0, 1.4X0, 1.5X0, 1.6X0
- TKR with realistic honeycomb
- TKR with homogeneous honeycomb

10GeV electrons - small beamspot

e10GeV_TKR



- 1.3X0, 1.4X0, 1.5X0, 1.6X0
- TKR with realistic honeycomb
- TKR with homogeneous honeycomb