Laboratoire d'Annecy-le-Vieux
de Physique des Particules

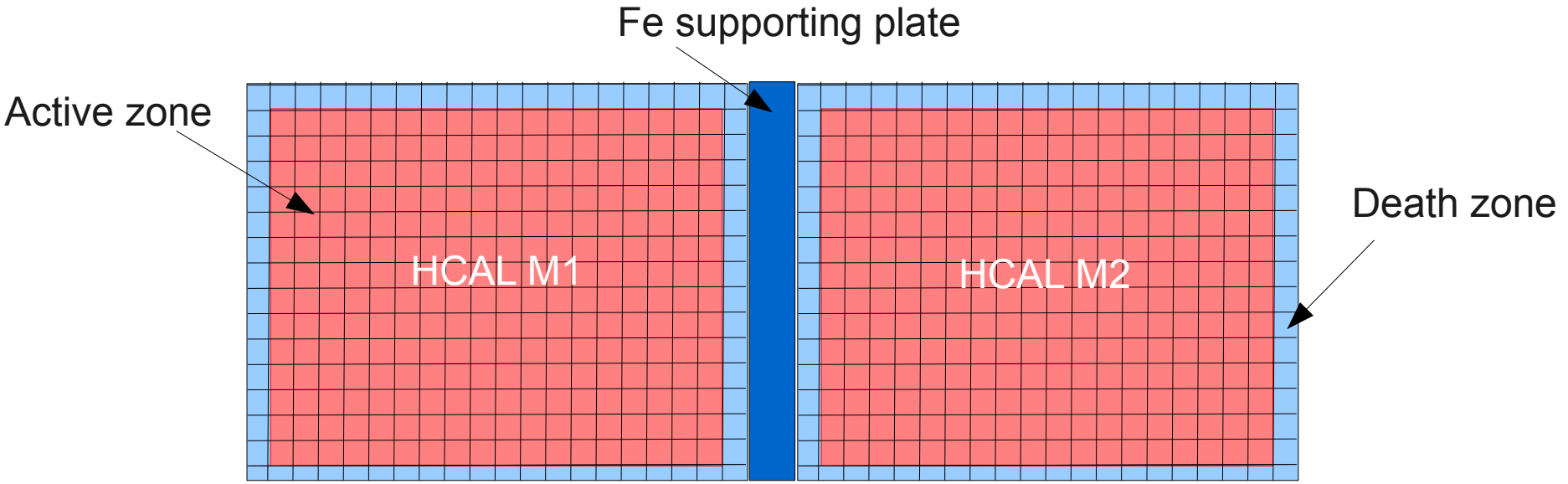
Update on simulation studies

Jan BLAHA

Micromegas Physics Meeting, 20 Avril 2010, LAPP

In2p

Impact of the death zone along the modules boundary



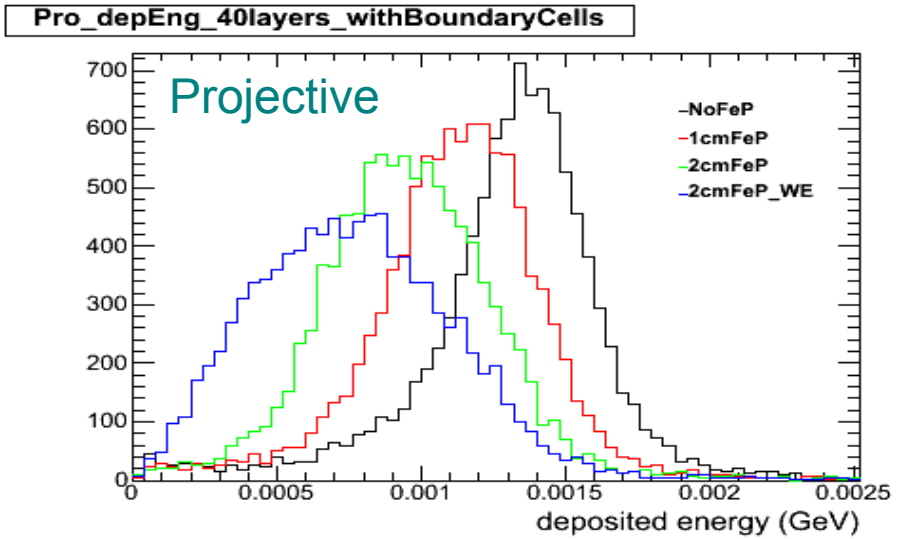
It is expected to have ~ 1 cm death zone around Micromegas detector.

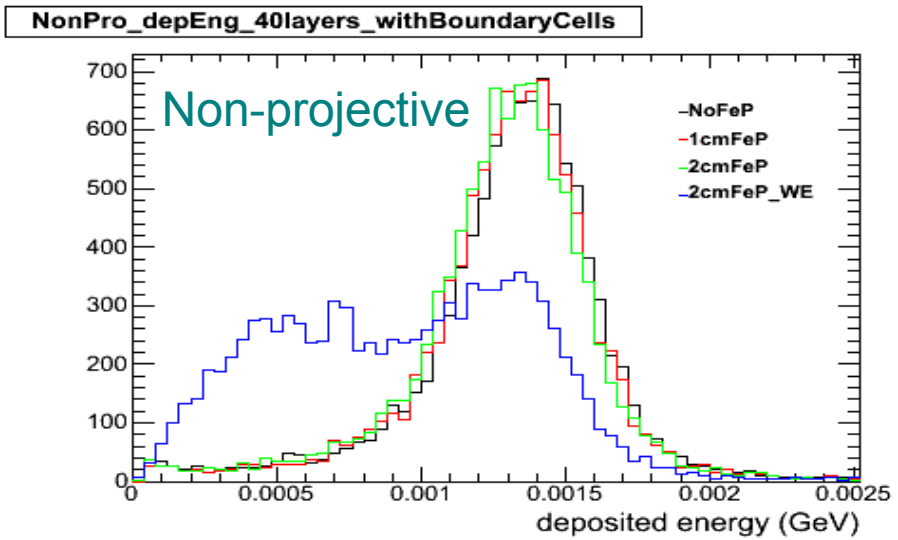
In order to quantify the impact of such a death zone, several configurations have been studied:

- No death zone along the boundary (0 Cell lines excluded)
- 1 cm death zone (1 Cell line excluded)
- 2 cm death zone (2 Cell lines excluded)
- ...

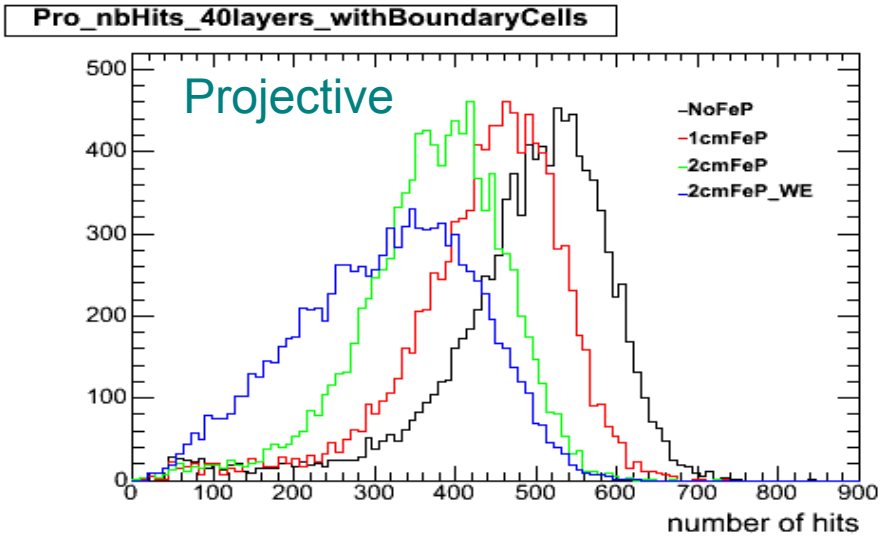
Projective vs non-projective, all the geometries, with boundary cells

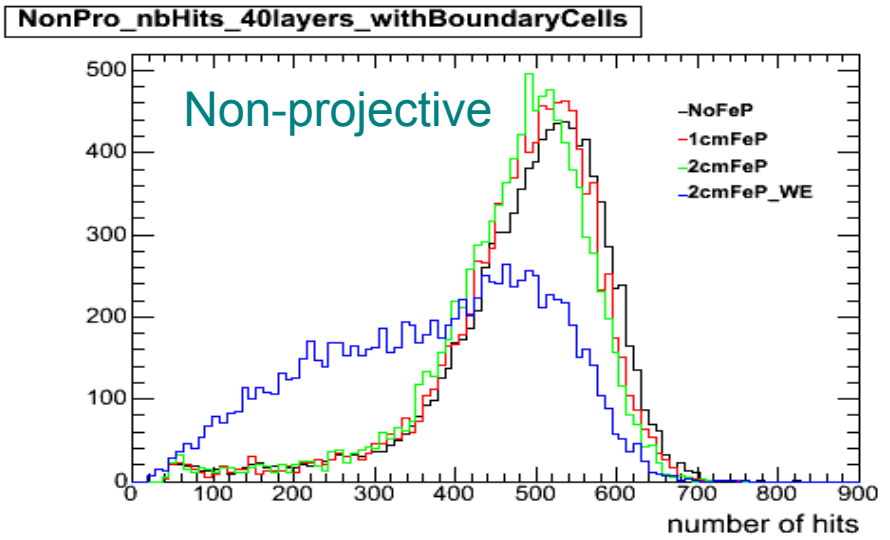
Analog readout





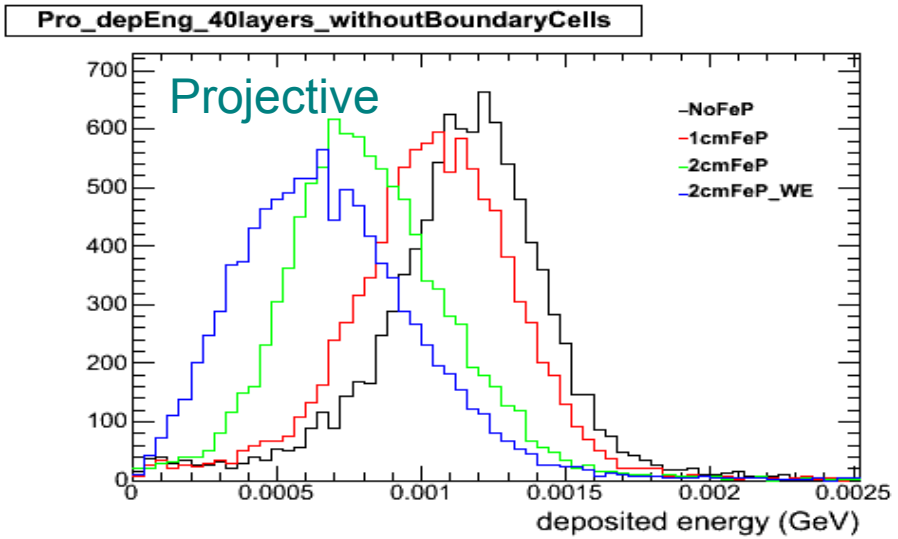
Digital readout

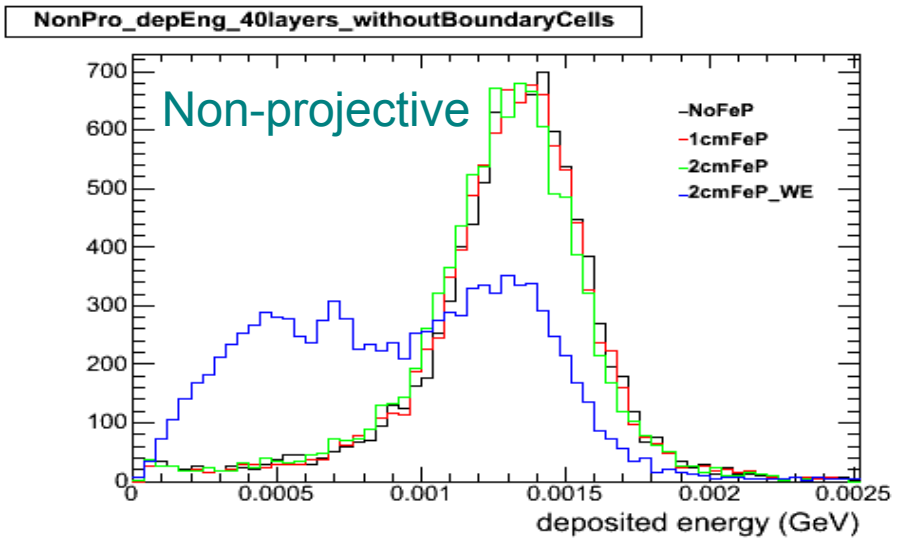




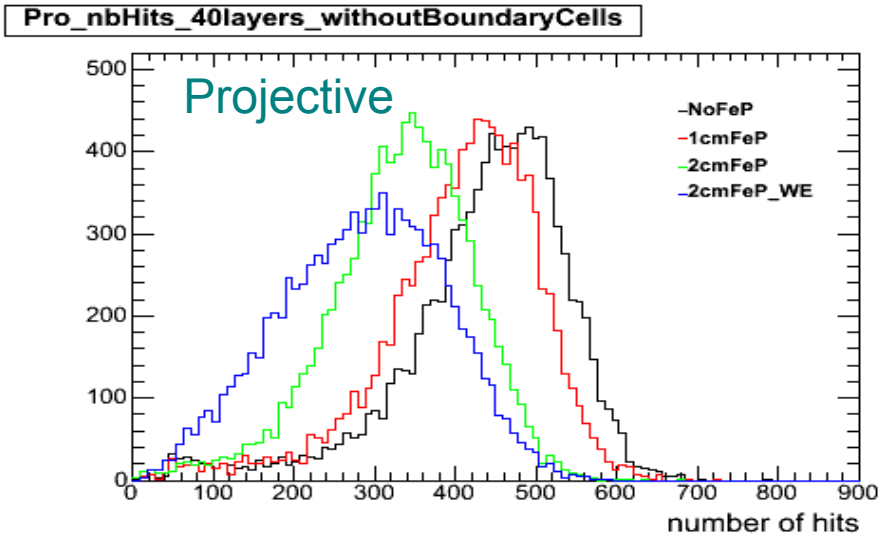
Projective vs non-projective, all the geometries, without boundary cells

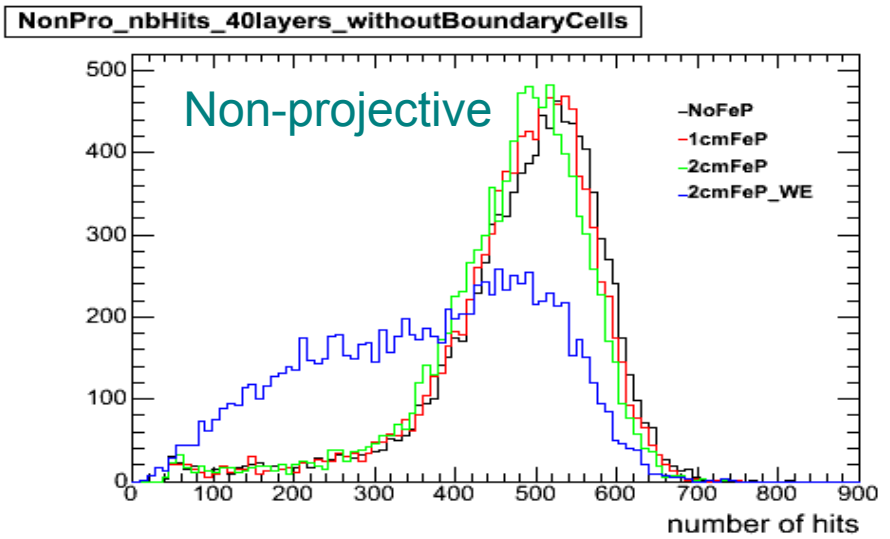
Analog readout





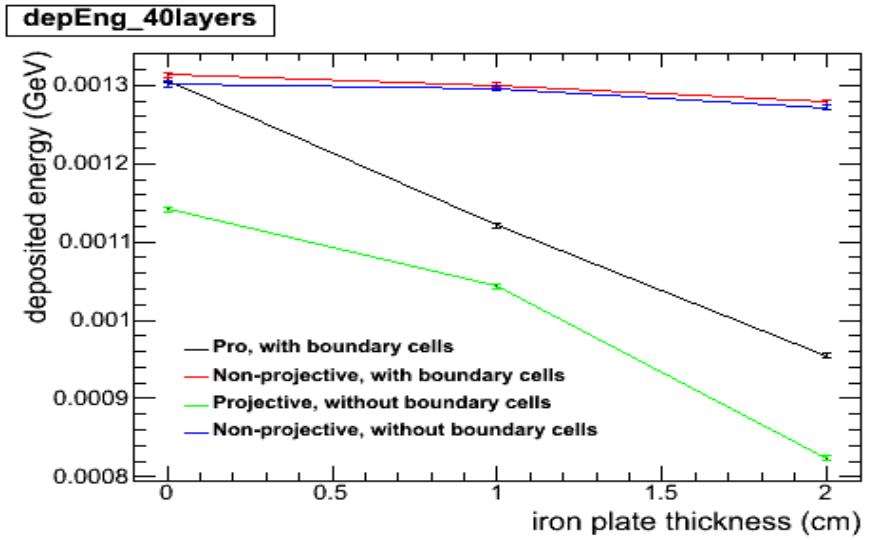
Digital readout

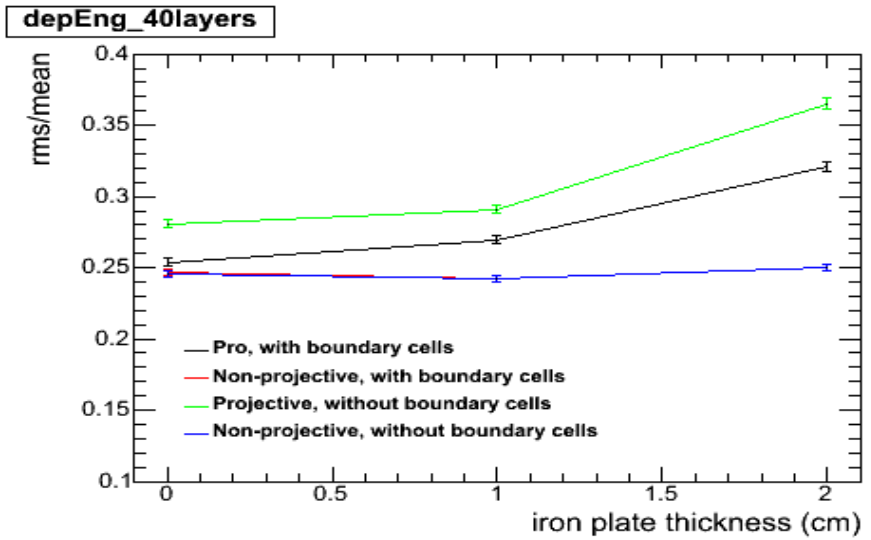




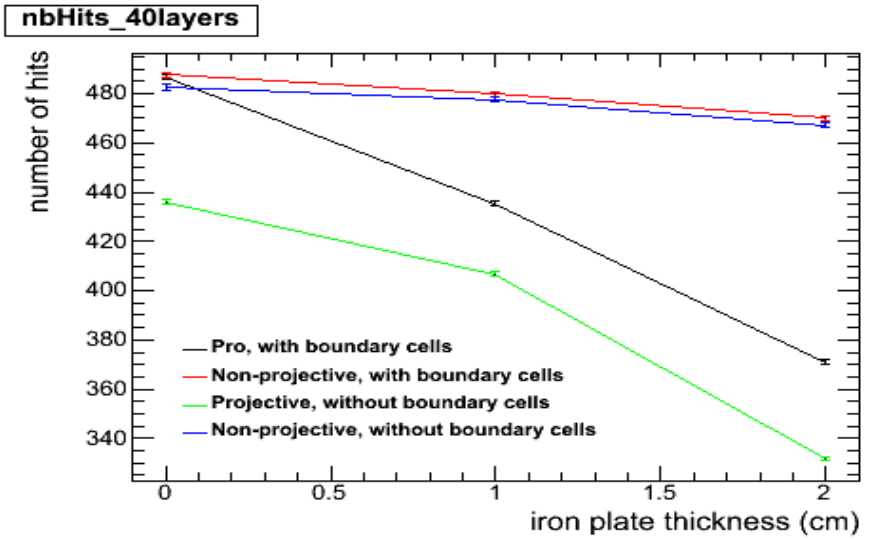
Calorimeter response and resolution vs iron plate thickness

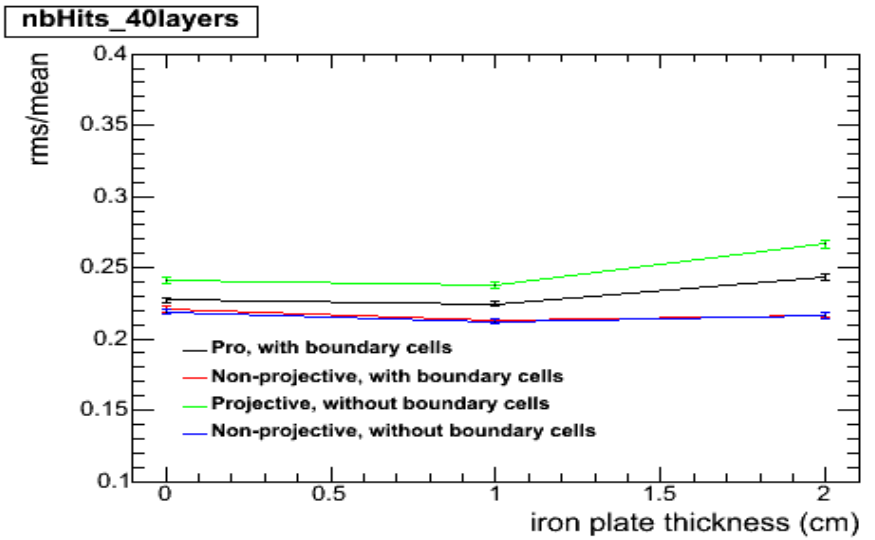
Analog readout





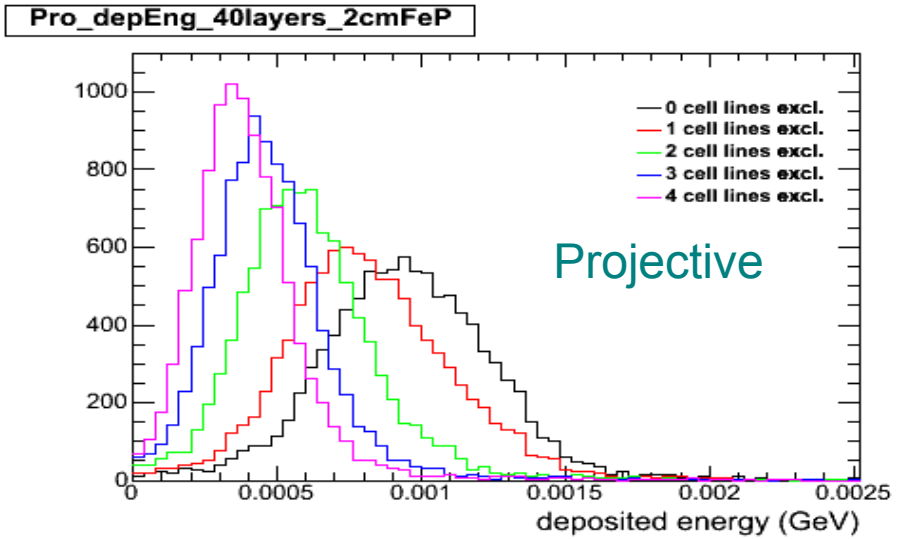
Digital readout

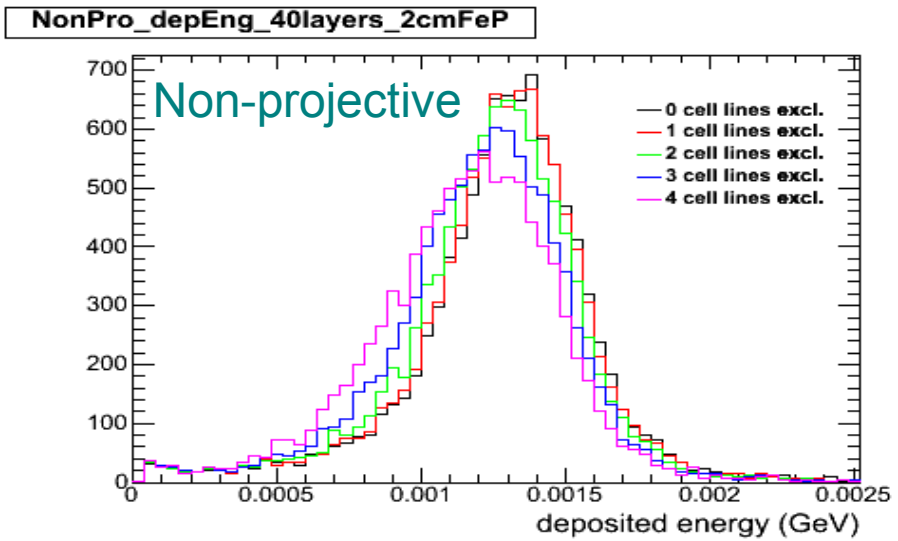




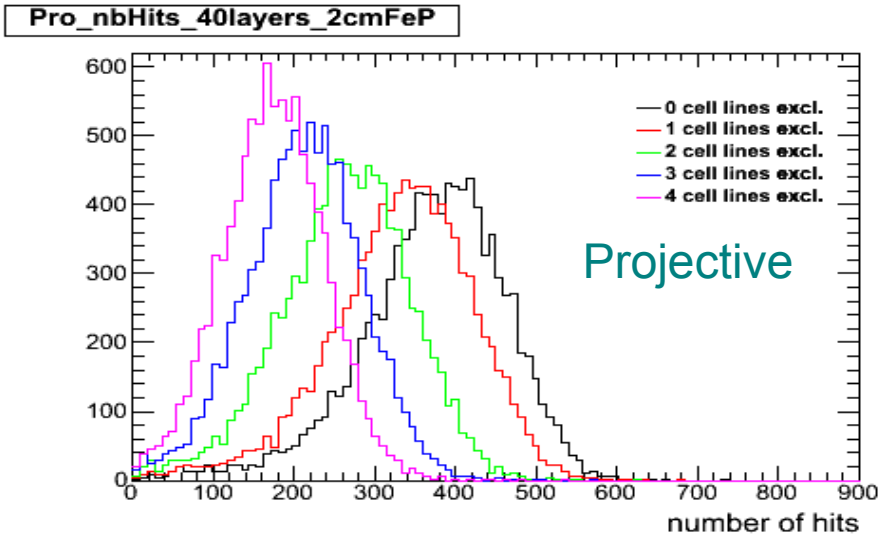
Projective vs non-projective geometry for different number of excluded cell lines

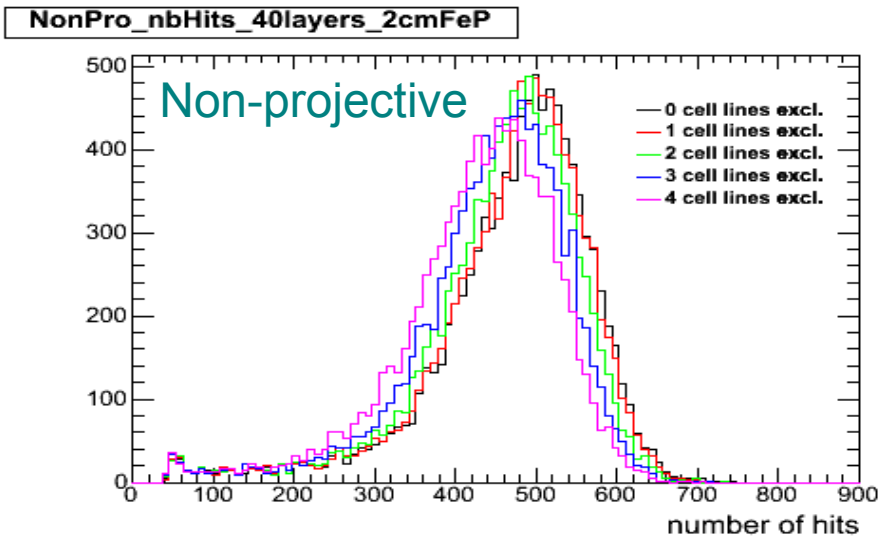
Analog readout





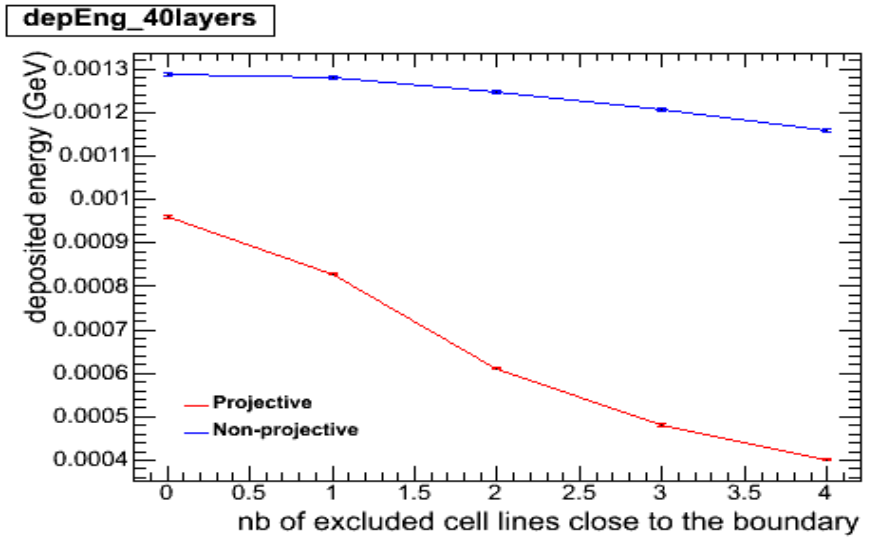
Digital readout

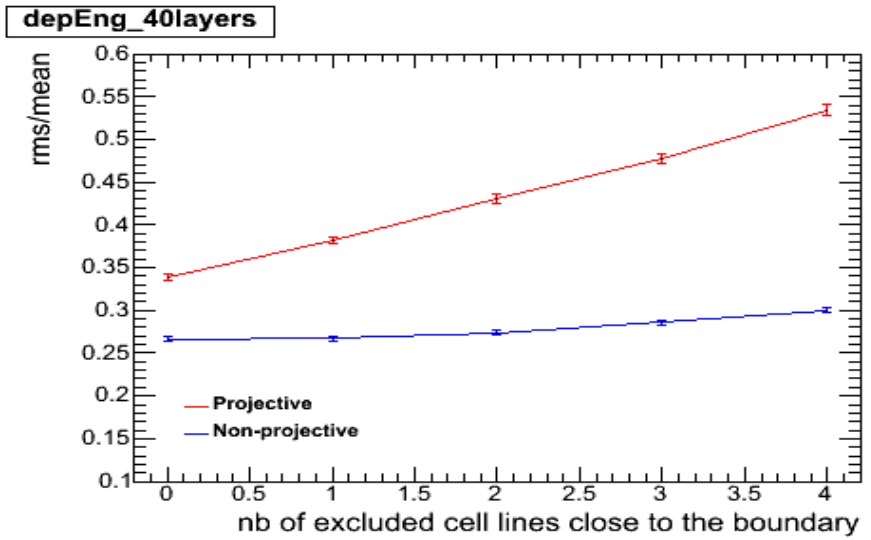




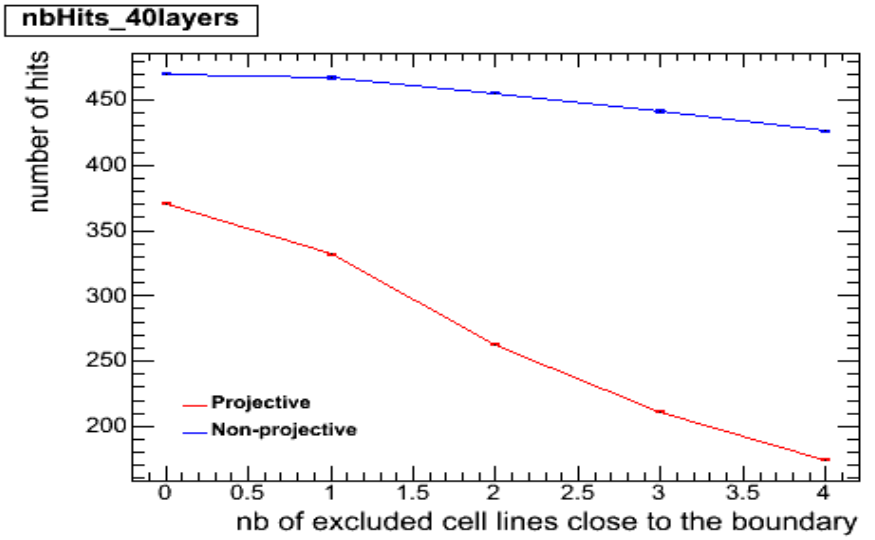
Calorimeter response and resolution vs number of excluded cell lines

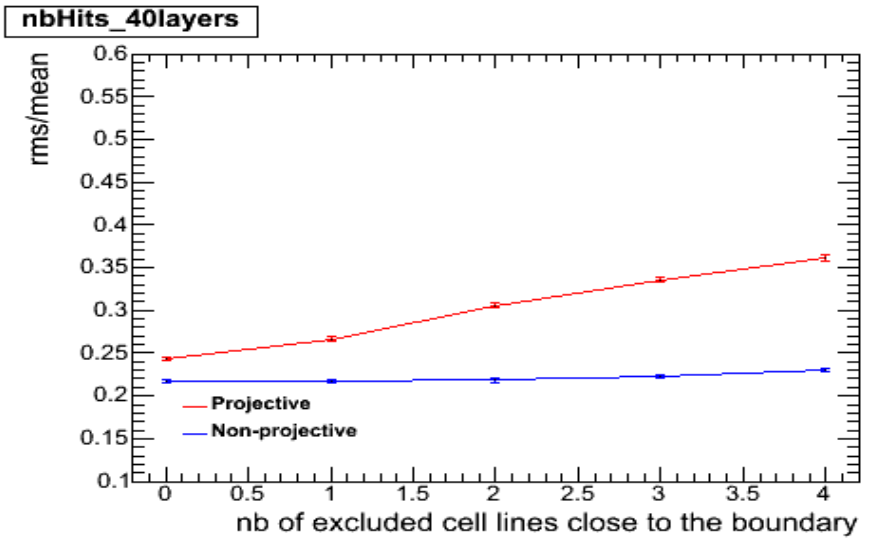
Analog readout



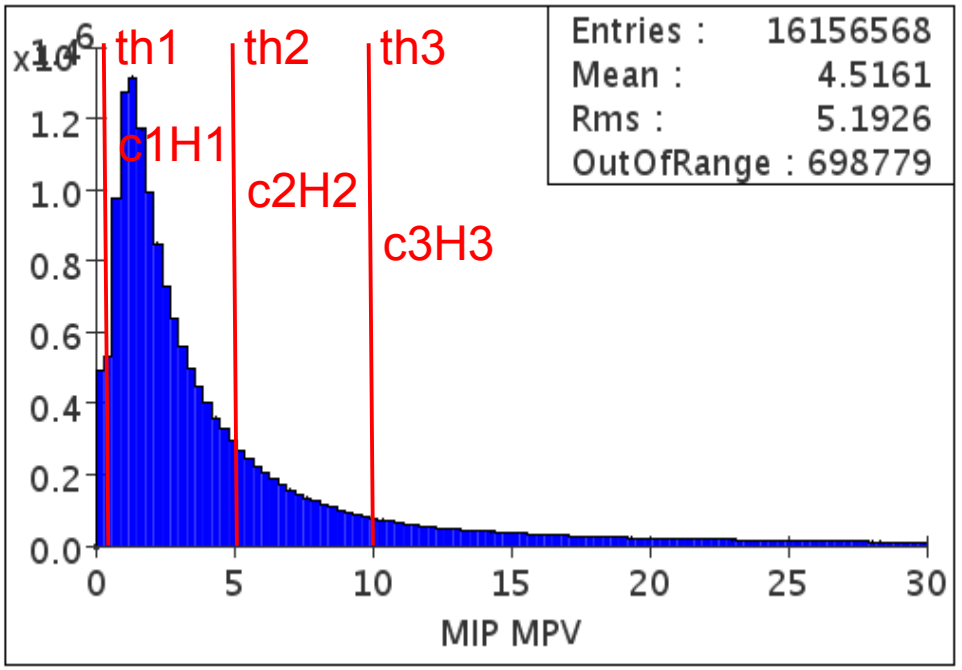


Digital readout





Semi-digital readout



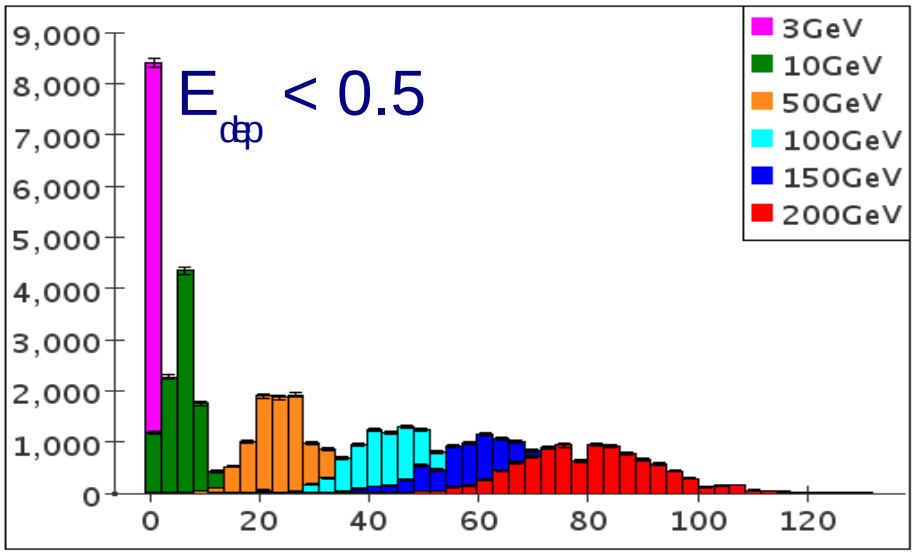
Simplified case with fixed thresholds (MIP MPV):
th1 = 0.5, th2 = 5, th3 = 10

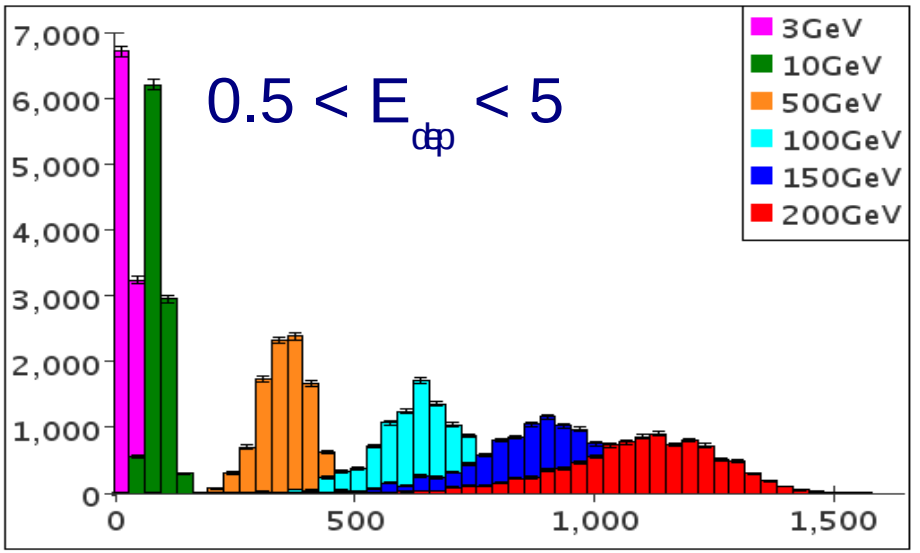
Optimal weighs → ch2 min.:

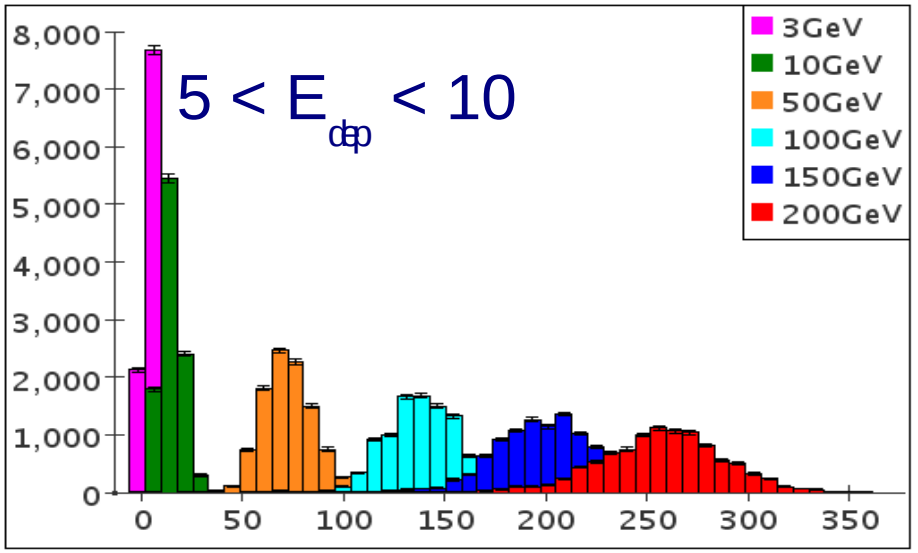
$$E_{rec} = \alpha \sum_{j}^{3} c_j H_j, \quad \sigma \approx \frac{1}{\sqrt{E_{true}}} \qquad \chi^2 = \frac{1}{N} \sum_{i=1}^{N} \frac{\left[\sum_{j}^{3} c_j H_j - E_{true} \right]^2}{\sigma^2}$$

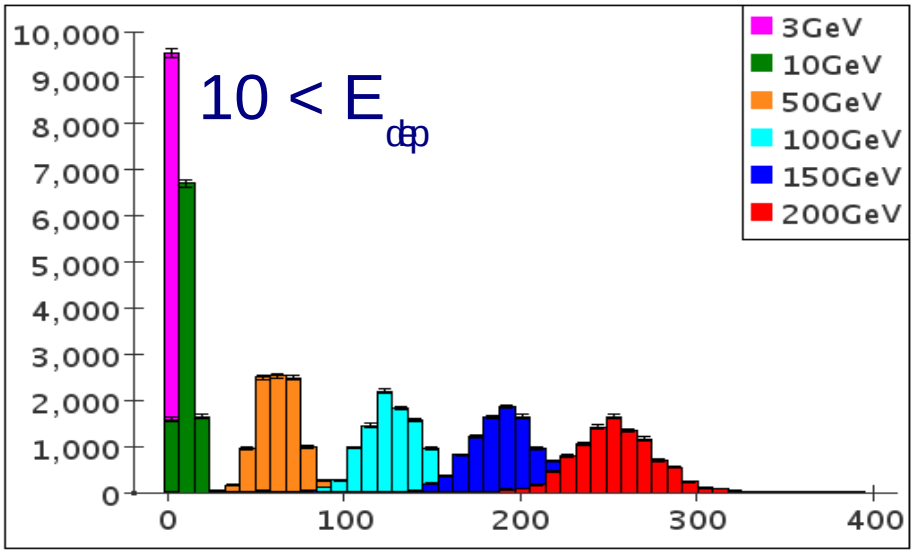
Nb of hits for different th. regions

thresholds: th1 = 0.5, th2 = 5, th3 = 10



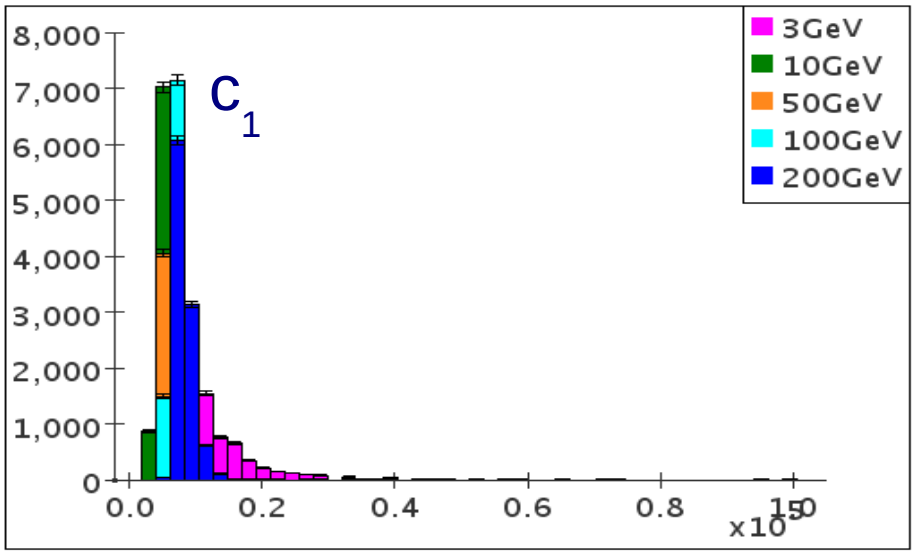


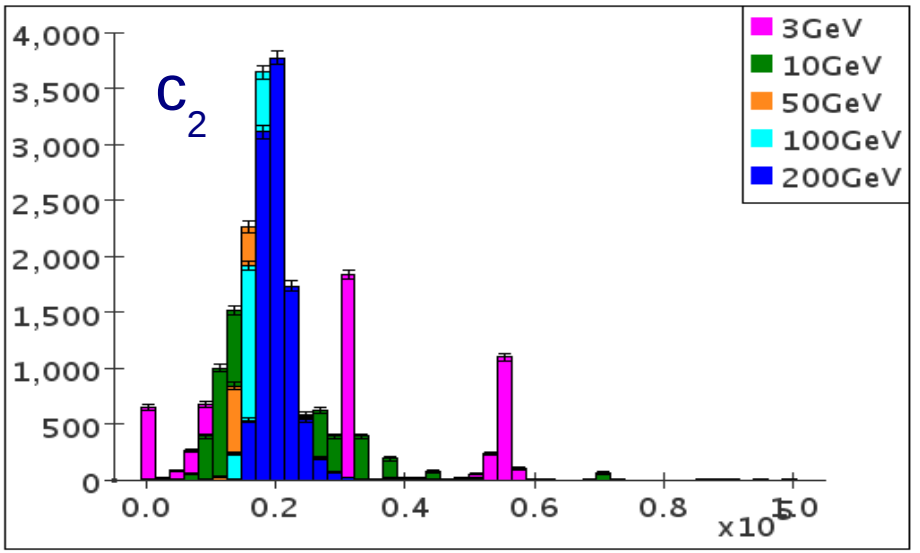


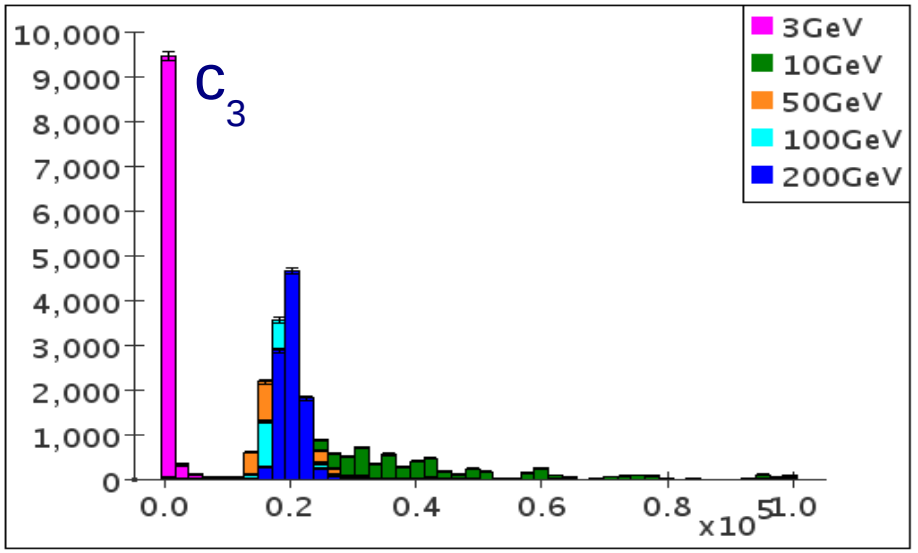


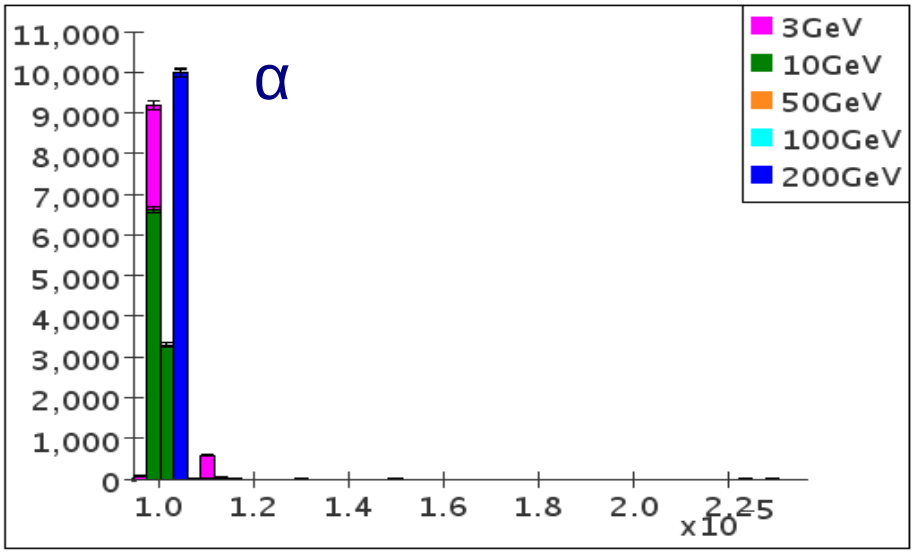
Optimal weights

thresholds: th1 = 0.5, th2 = 5, th3 = 10



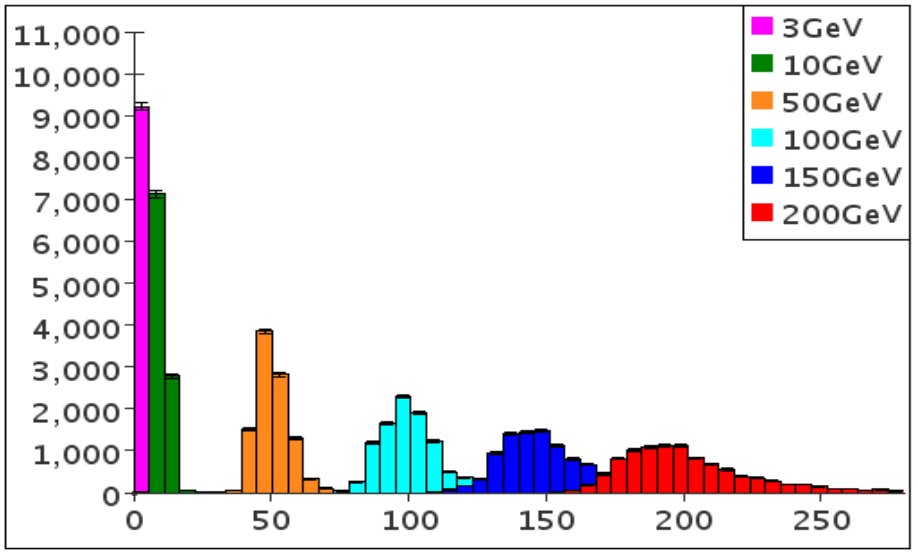


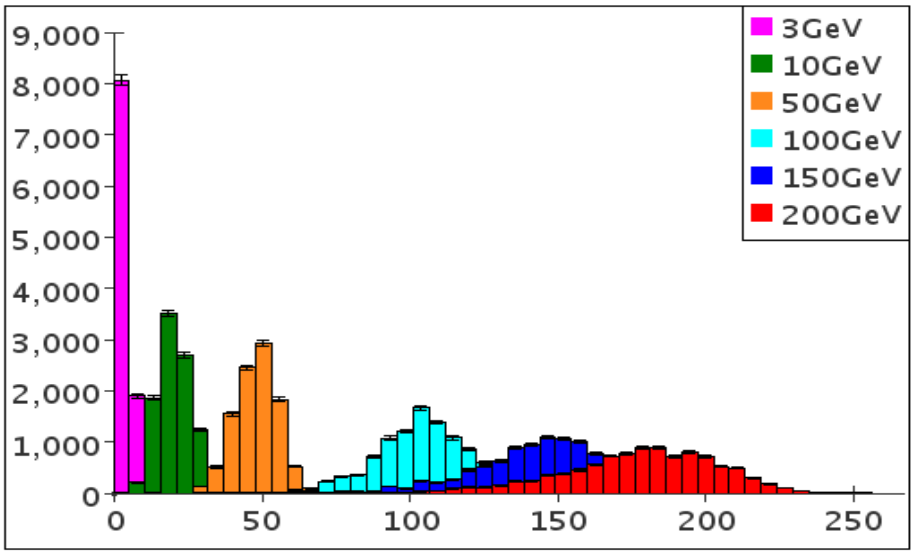


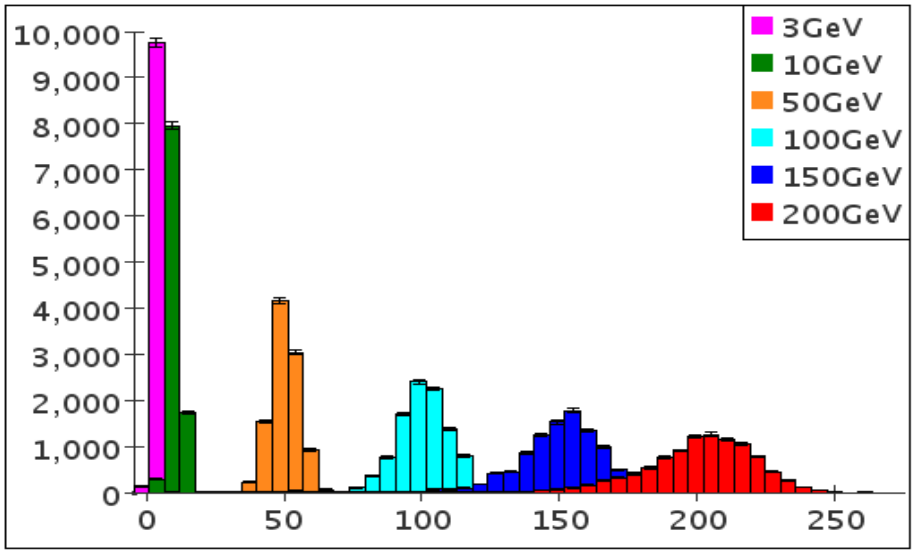


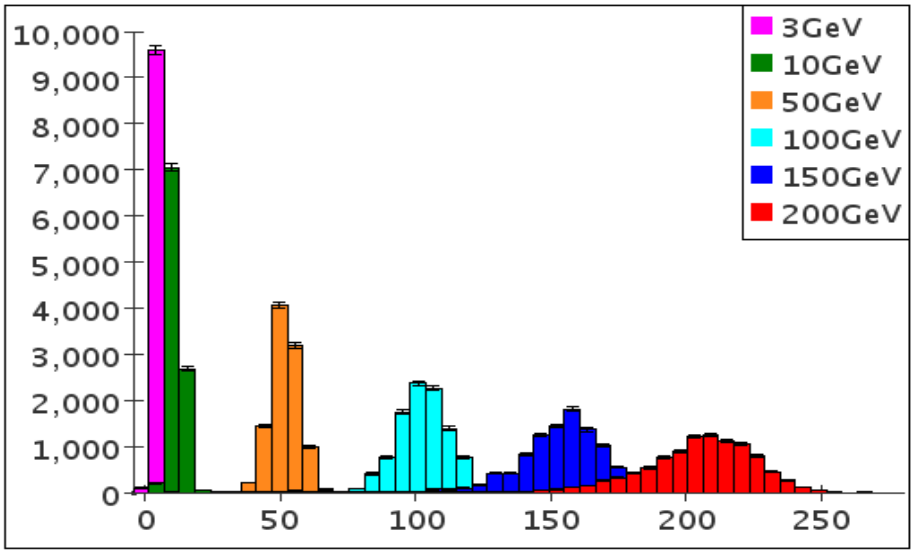
Reconstructed energy

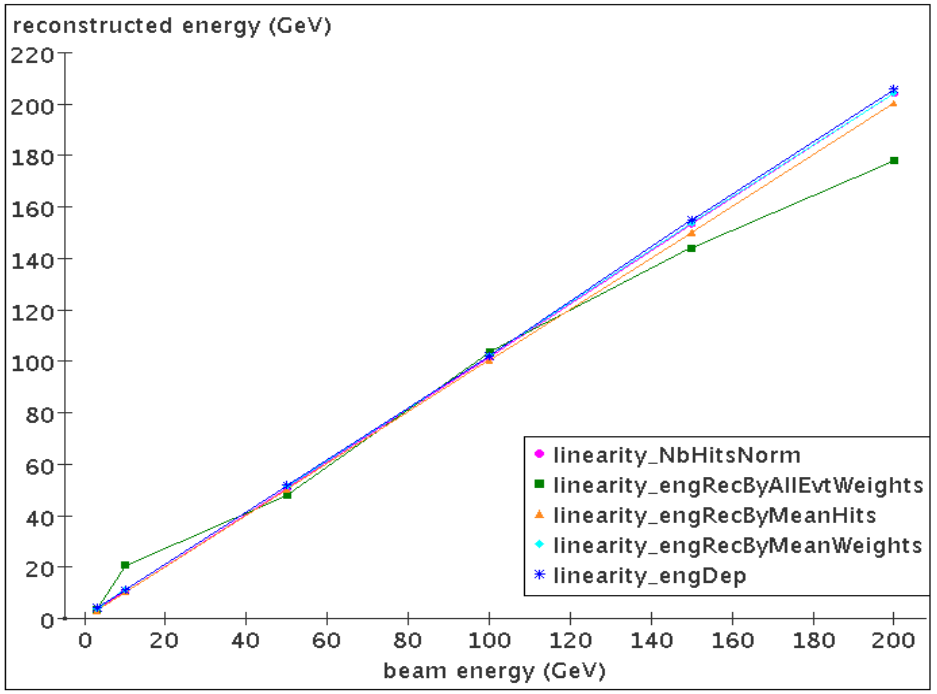
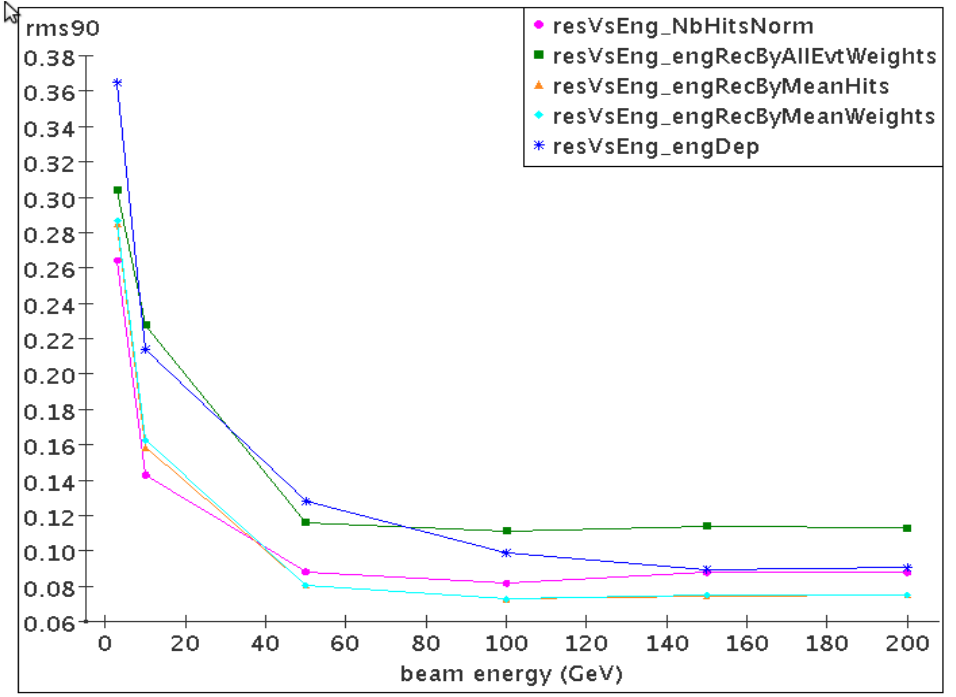
thresholds: th1 = 0.5, th2 = 5, th3 = 10









Linearity and resolution

thresholds: th1 = 0.5, th2 = 5, th3 = 10