Weekly Meeting

Edgar Nandayapa   07/29/11
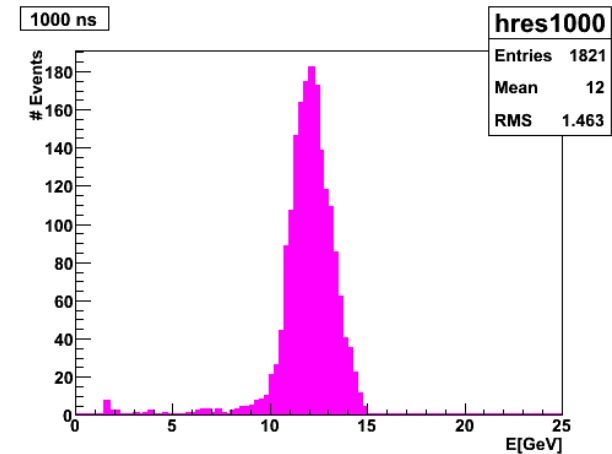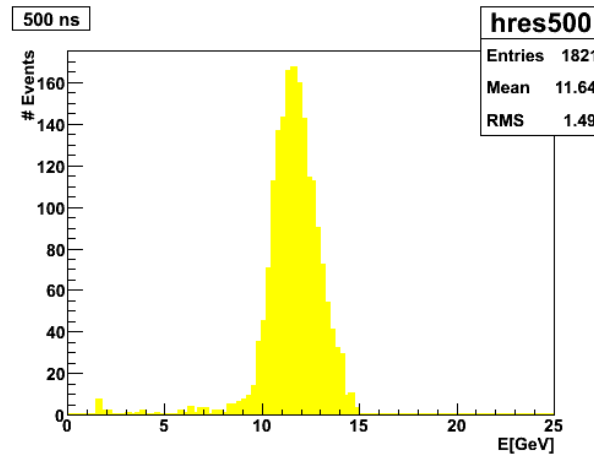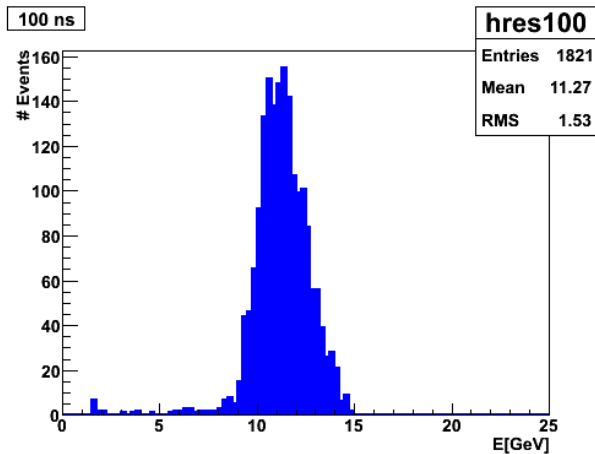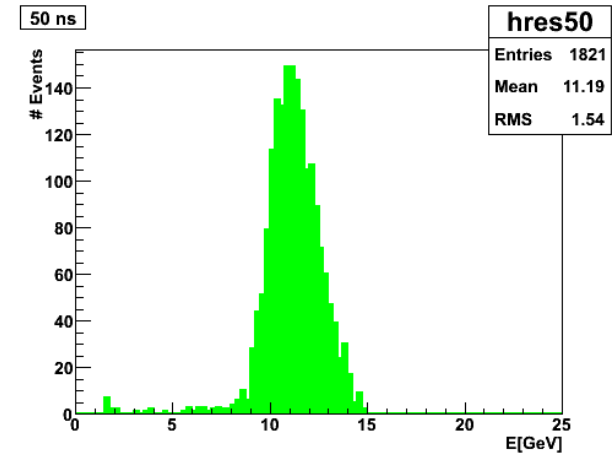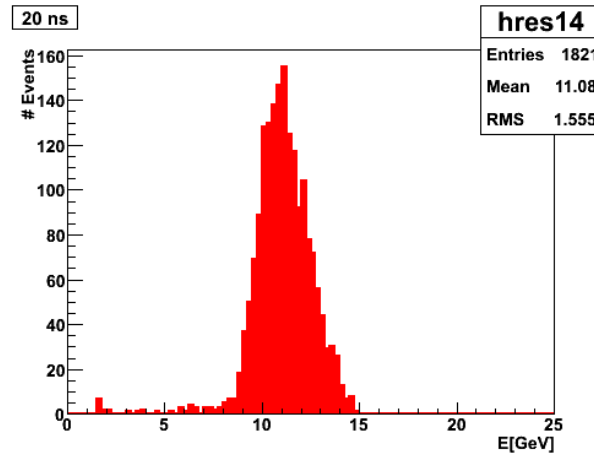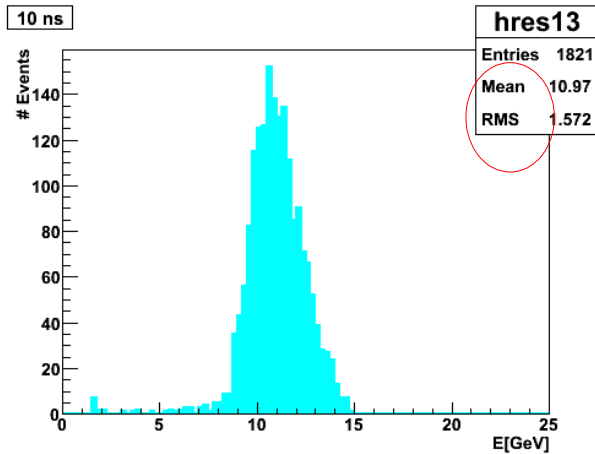
Timing cuts

- Interest in how fast timing cuts will **affect the resolution** of hadronic showers

- Timing cuts were done in the **Stepping Action**

- Measured the **total** amount of **energy deposited** for integrating windows of time (from 0.5 to 6.0ns in 0.5 ns steps, and 10,20,50,100,500,1000 ns)

Timing cuts

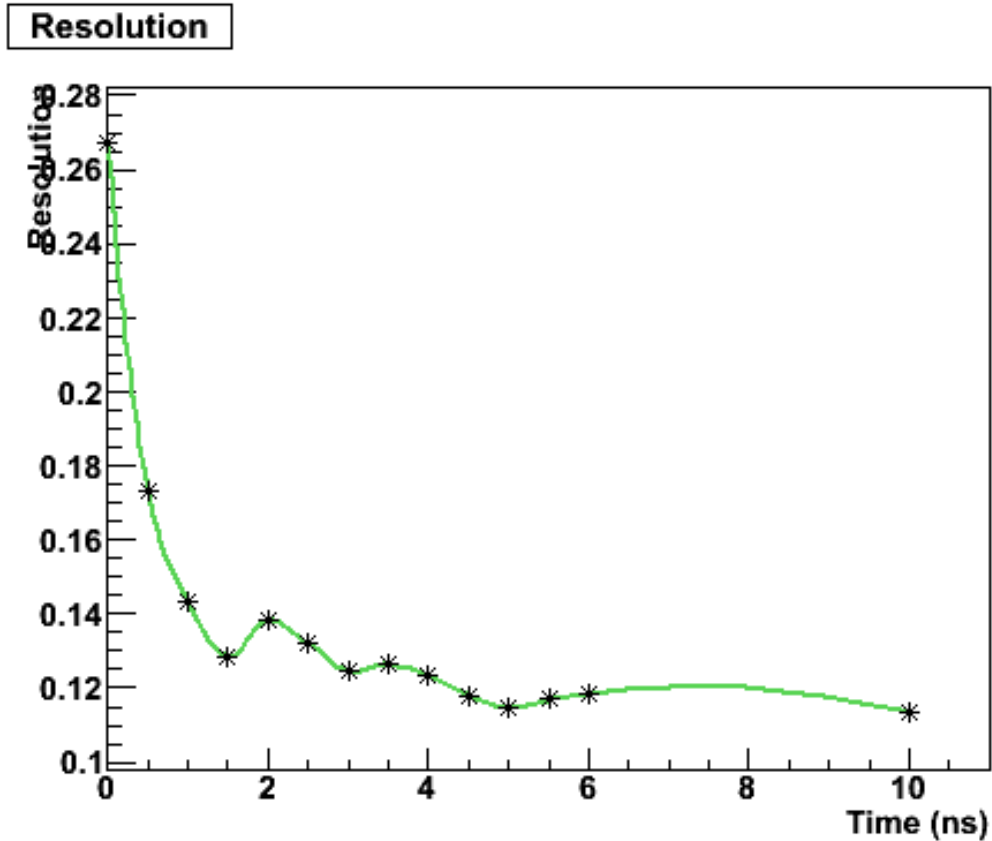RMS was chosen for electrons and sigma (from gaussian fit) for pions.

Resolution and Response of the Detector

Gauss Fit
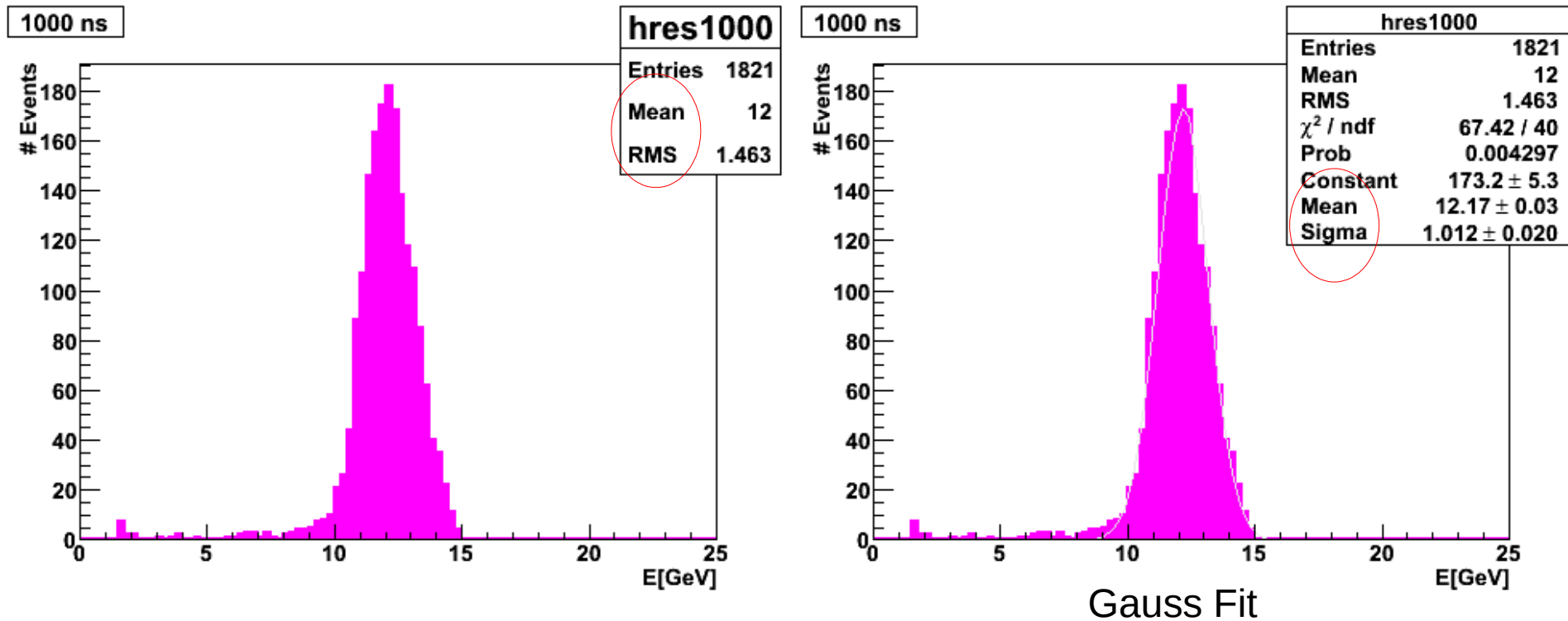
$$\text{Resolution} = \frac{\text{Mean}}{\text{RMS}}$$

$$\text{Response} = \frac{\text{Mean vs}}{\text{Integration time}}$$
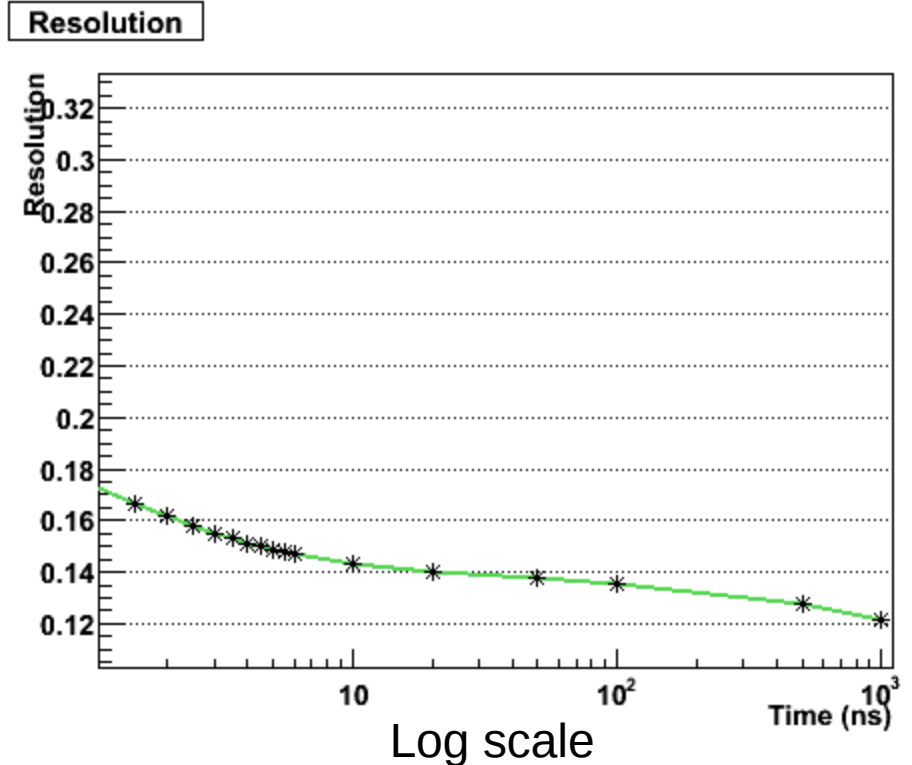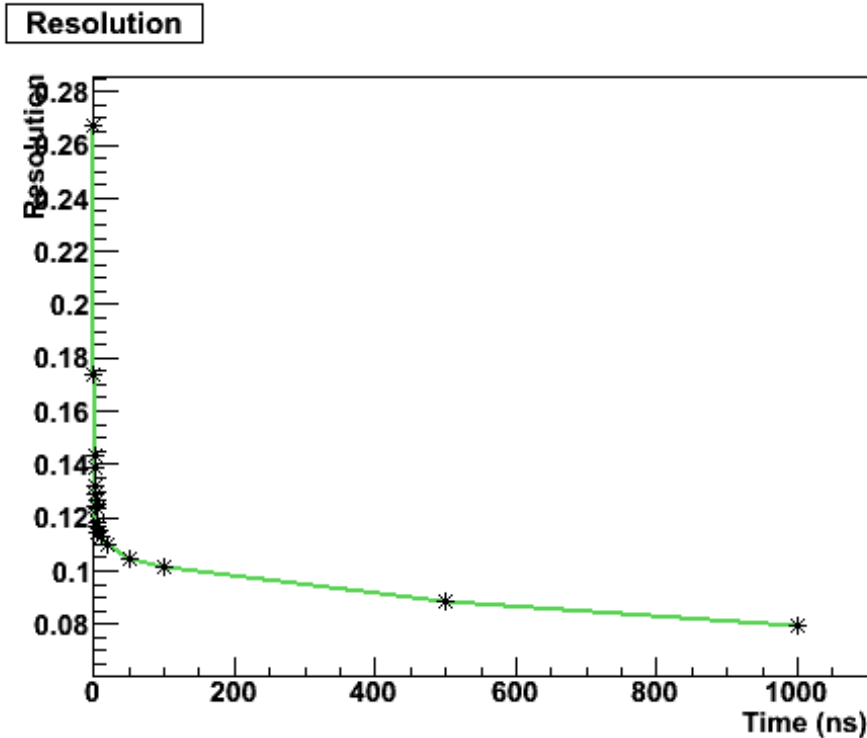
4

Resolution of pions

Graph of the resolution during the first 10 ns

1821 pions
15 GeV

Resolution of pions
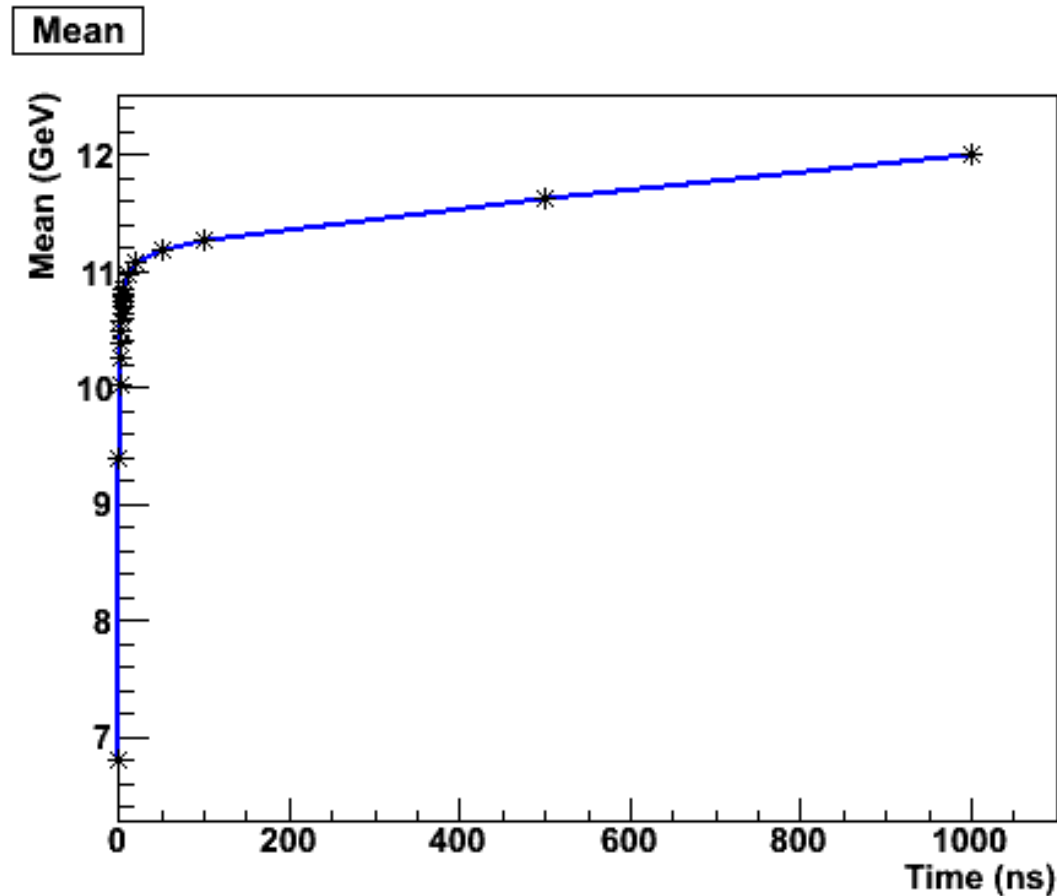

Log scale

Graph of the resolution for the first microsecond

Between 10 ns and 1000 ns, the resolution changed by ~2.5%
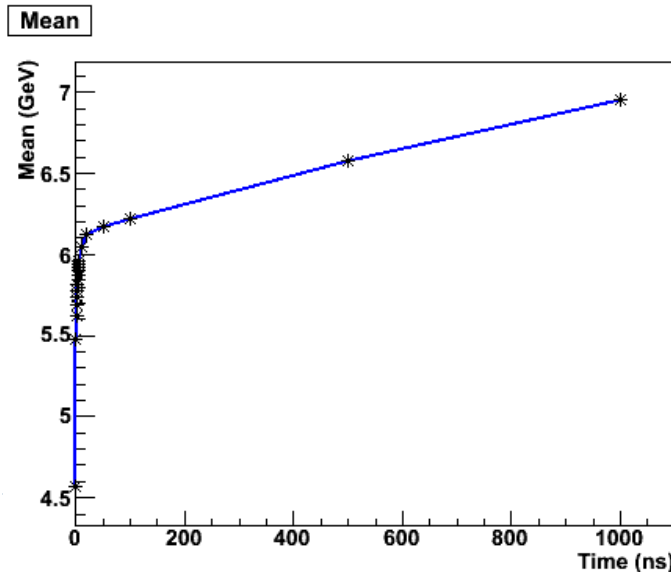
1821 pions
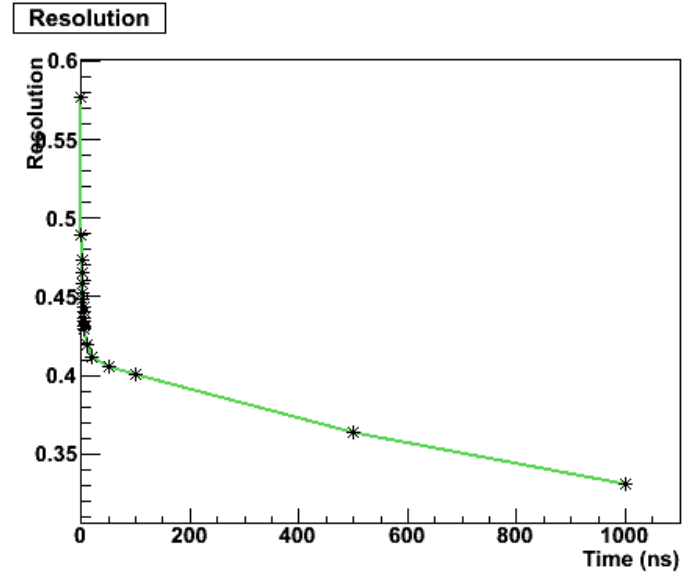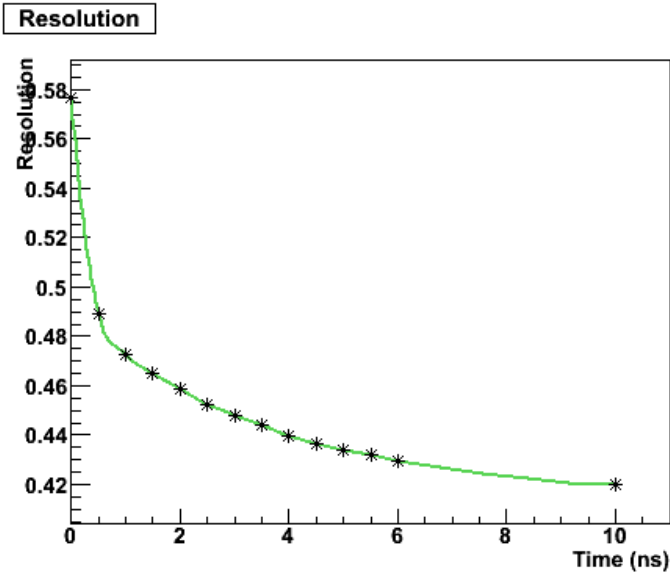15 GeV

6

Response of pions

Graph of the response for the first microsecond
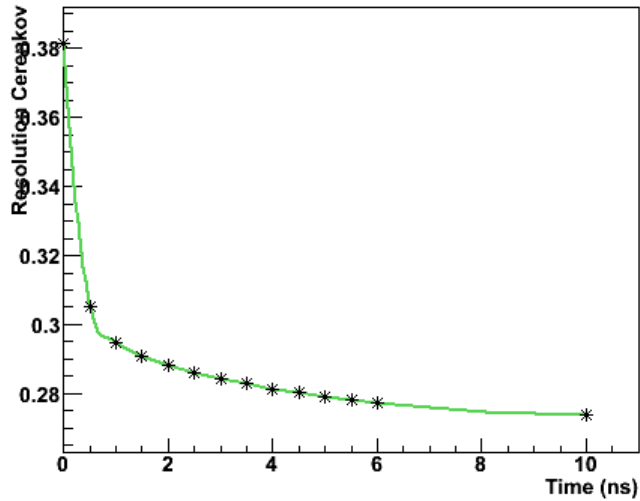
1821 pions

15 GeV

EM Edep Resolution of pions

Resolution not good during the first microsecond
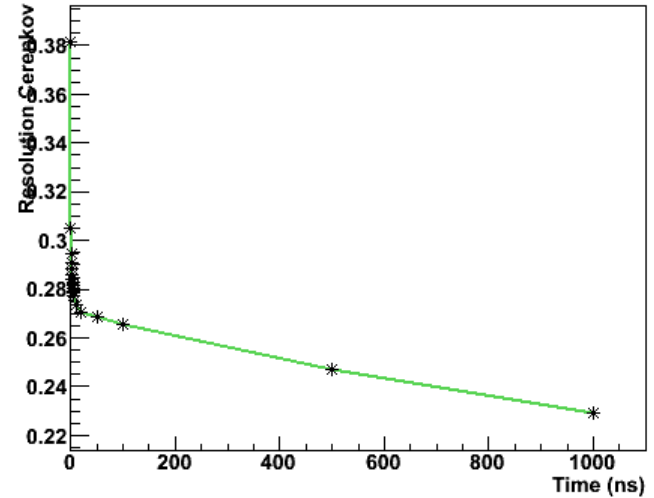
1821 pions
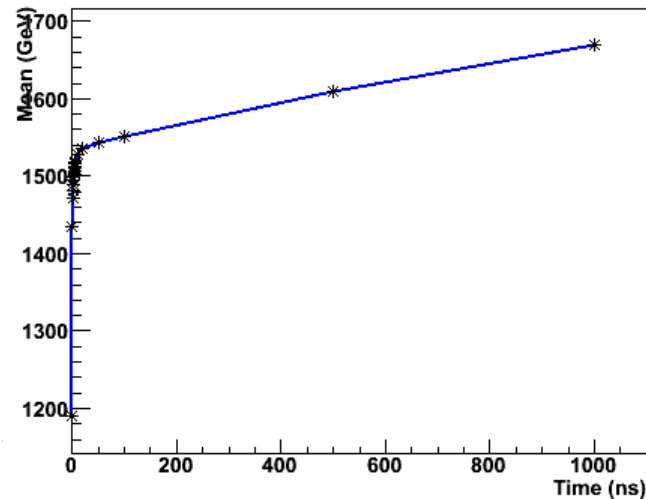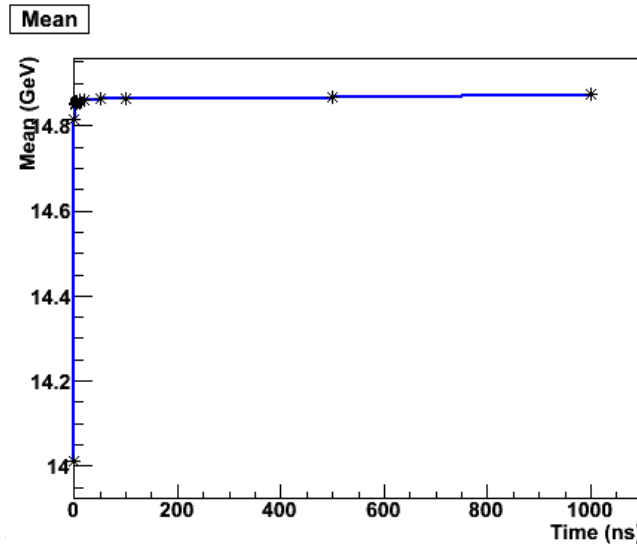15 GeV

Cerenkov Photons Resolution for pions
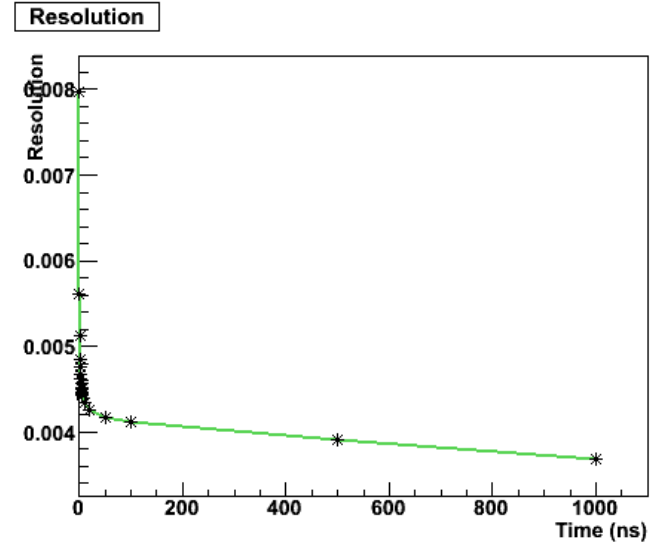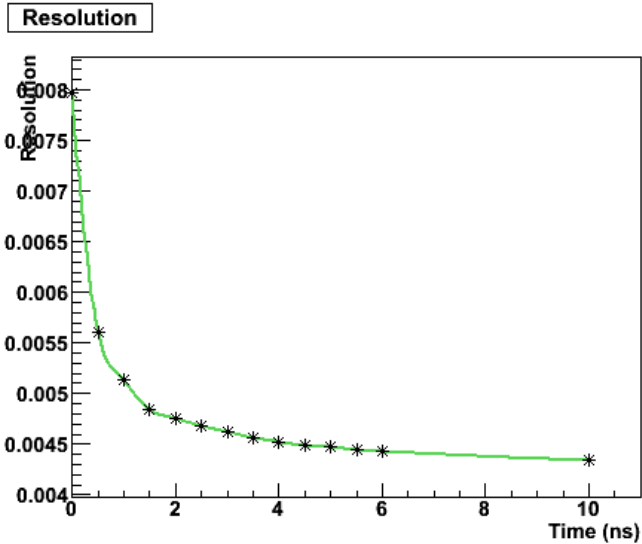

1821 pions
15 GeV

Edep Resolution of e-

Between 10 ns and 1000 ns, the resolution changed by ~0.05%

4000 electrons
15 GeV

Conclusions

- Resolution for the EM energy deposition of pions is worst than for the total energy deposited.

- After 10 ns The resolution of pions stays almost the same at 9.9 ± 0.9%

- The resolution of electrons stabilizes at 0.40 ± 0.02% after few seconds the shower started.