
Em physics

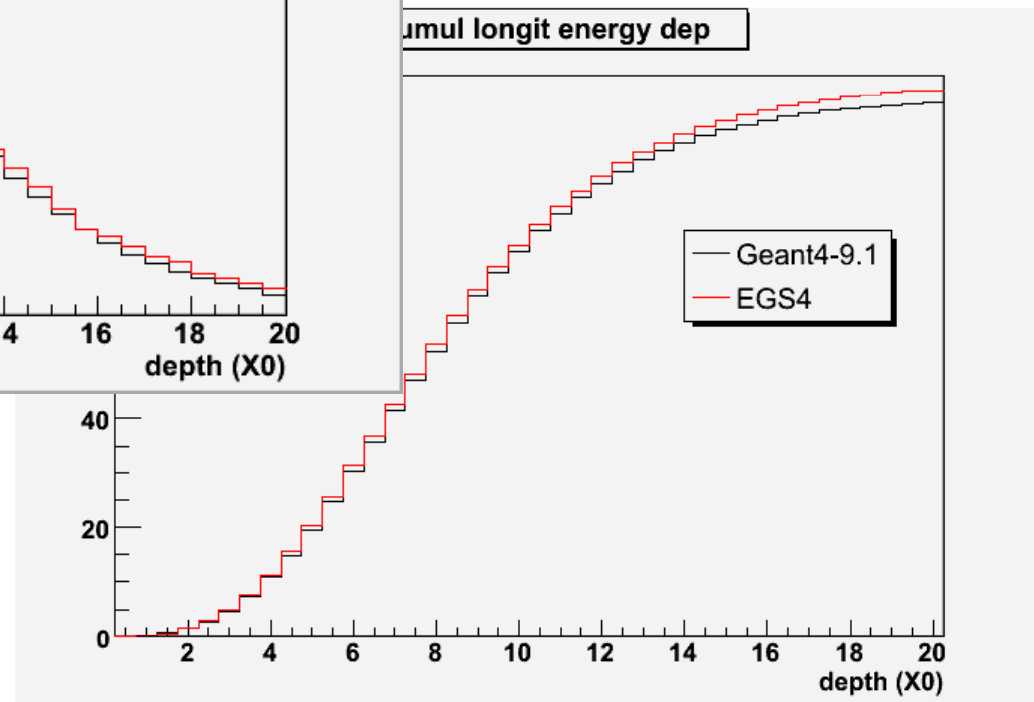
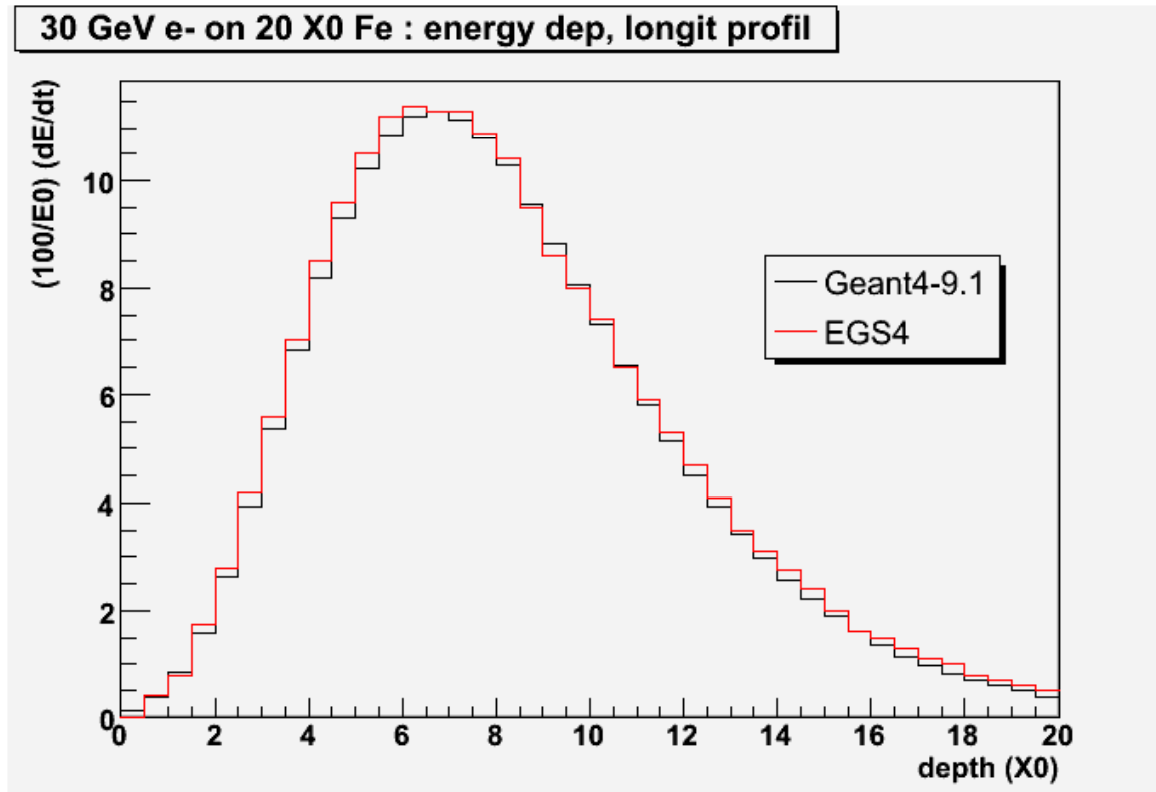
Recent verification and validation tests

Sabine Elles, Jean Jacquemier, Michel Maire
(Lapp/Annecy)

old-new verification/validation plots

- Em2/egs4
 - e- 30GeV shower profile
 - Em5/berger
 - e- 1MeV in thin layer
 - Em5/tramu
 - muon 1 TeV
 - Em5/mumsc
 - muon 10 GeV
 - Em11/sandia
 - Em12/berger
 - depth dose profile, e- 10keV \rightarrow 1MeV
 - fanoCavity
 - fanoCavity2
 - e- transport : eV \rightarrow MeV
- based on public TestEm serie: code unchanged, appropriate macro
 - each subdirectory has 'data', ROOT and PAW scripts to plot them

Em2/egs4



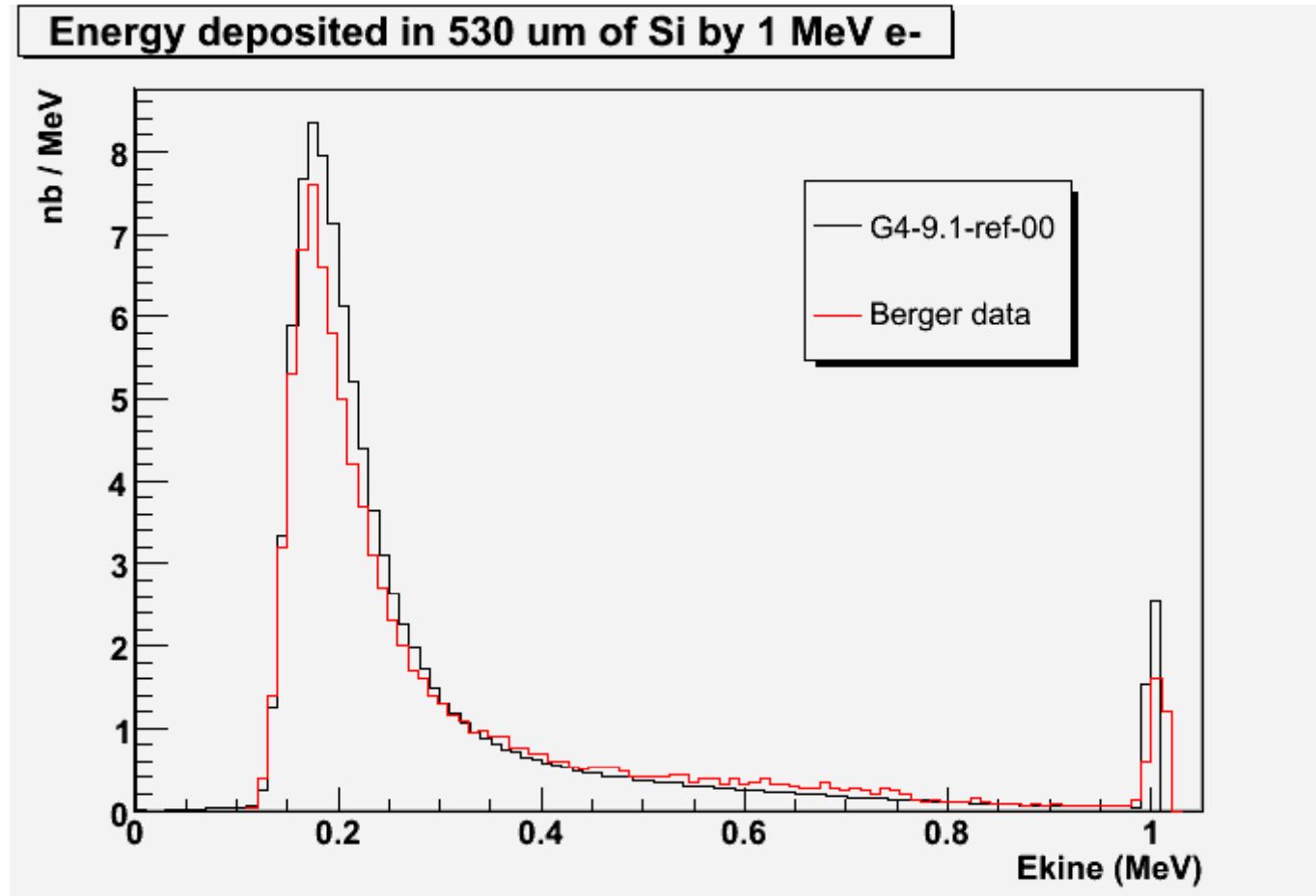
EGS4 from PDG plot

06/02/2008

recent verification and validation plots

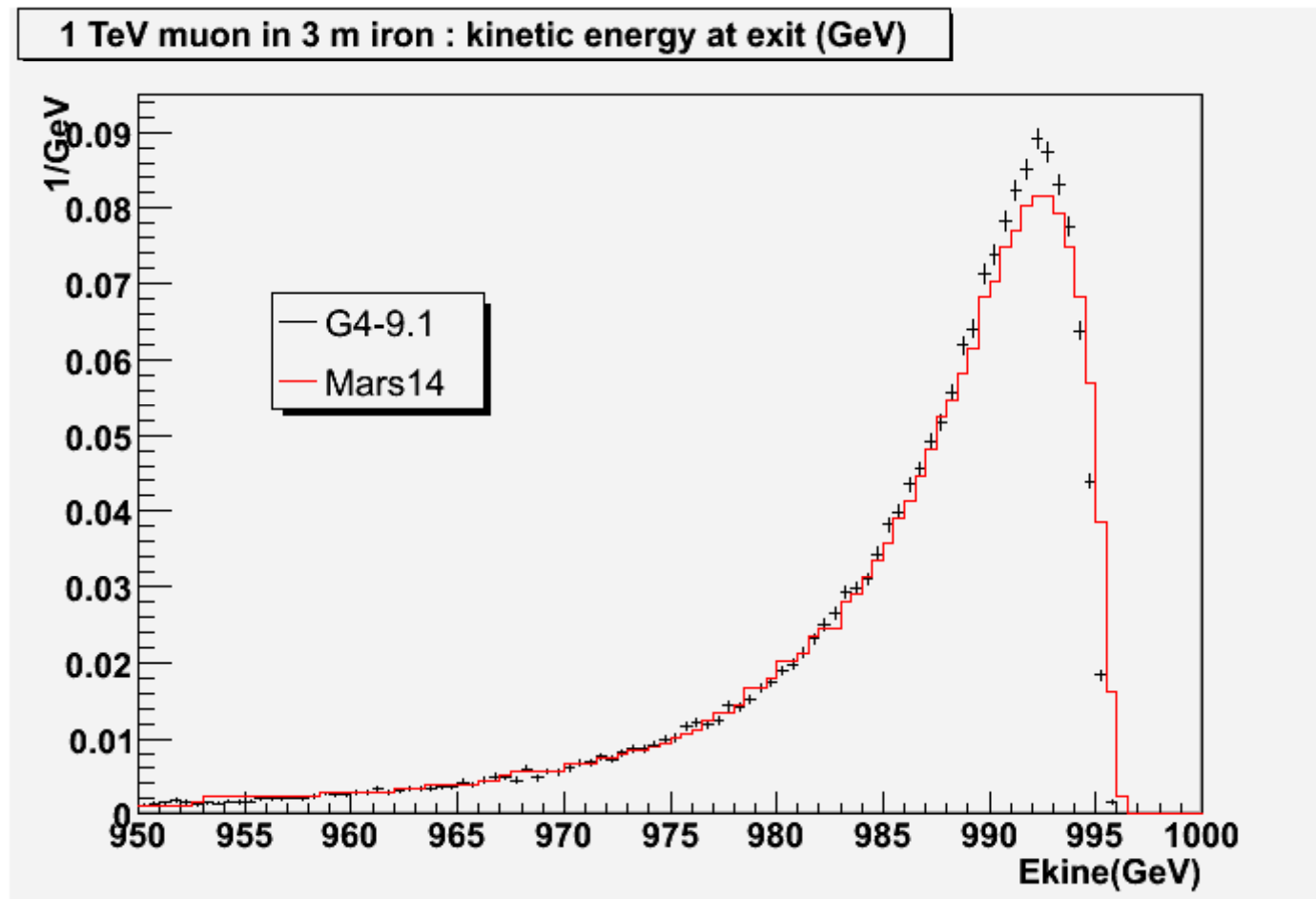
3

Em5/berger



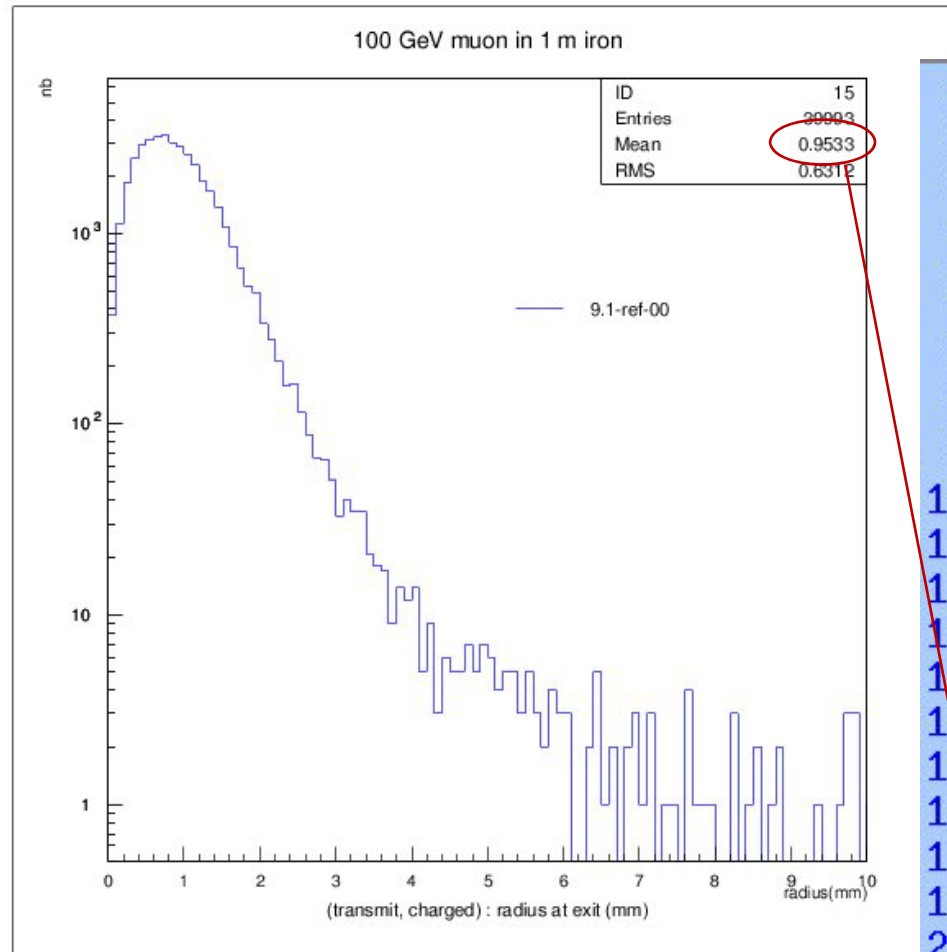
Berger et al.
NIM 69 p.181

Em5/tramu



Mars14 from
PDG plot

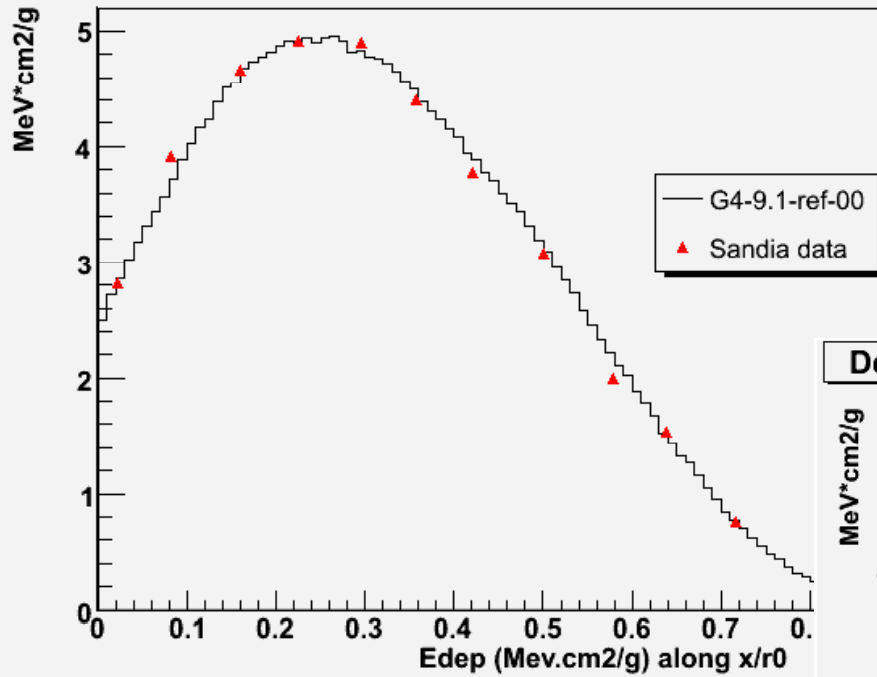
Em5/mumsc



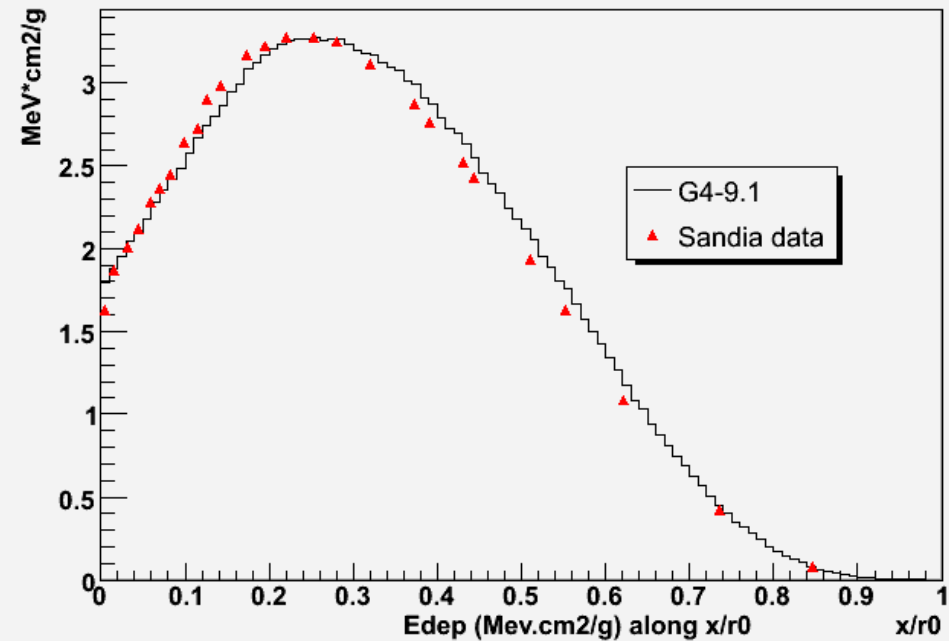
```
1 Lateral deviation at end point
2 (mean value of histo 15)
3 -----
4 ref : Pedro.Arce@ciemat.es
5
6 G4 version      Deviation
7
8 4.1              752 um
9 5.0              600 um
10 5.1             605 um
11 5.2             853 um
12 6.0             1416 um
13 6.0-p1         1109 um
14 6.1             752 um
15 6.2             849 um
16 7.1             1040 um
17 8.1             1040 um
18 8.2             934 um
19 9.0             925 um
20 9.1             953 um
21
```

Em11/sandia (1)

Depth dose distribution of 314 keV e- in Al



Depth dose distribution of 1033 keV e- in Al



Sand79-0414.UC-34a (Feb.1987)

O.Kadri et al. NIM B 258 (2007) p.381

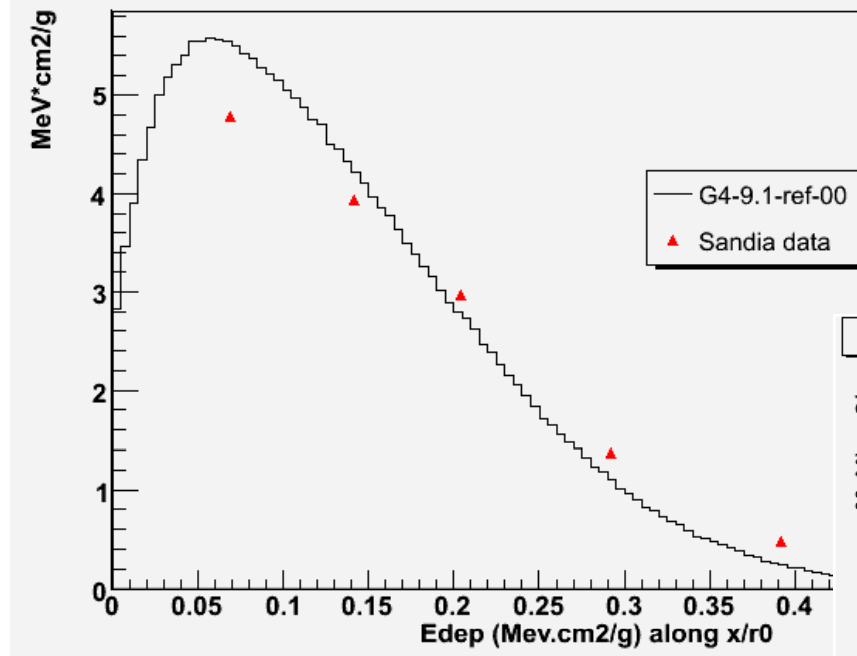
06/02/2008

recent verification and validation plots

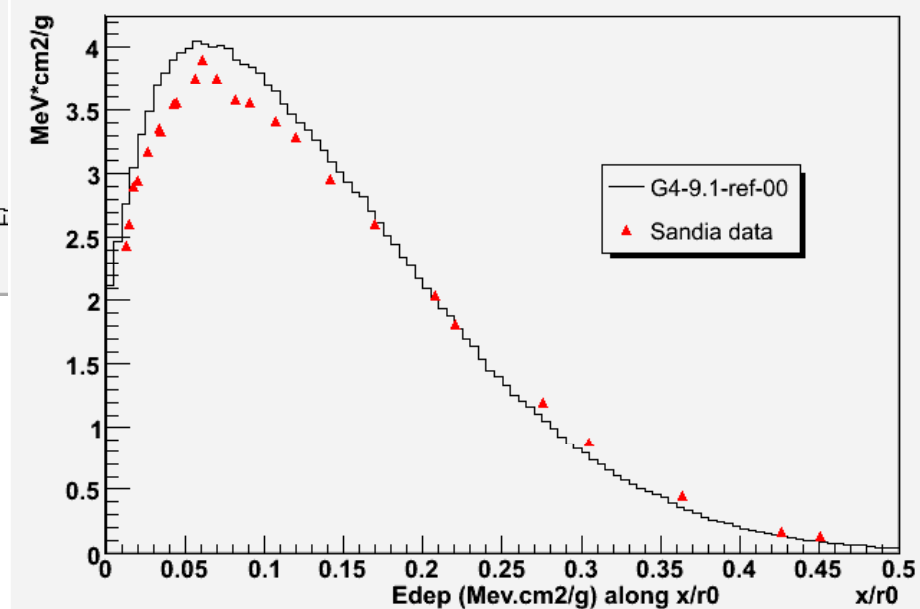
7

Em11/sandia (2)

Depth dose distribution of 300 keV e- in Ta



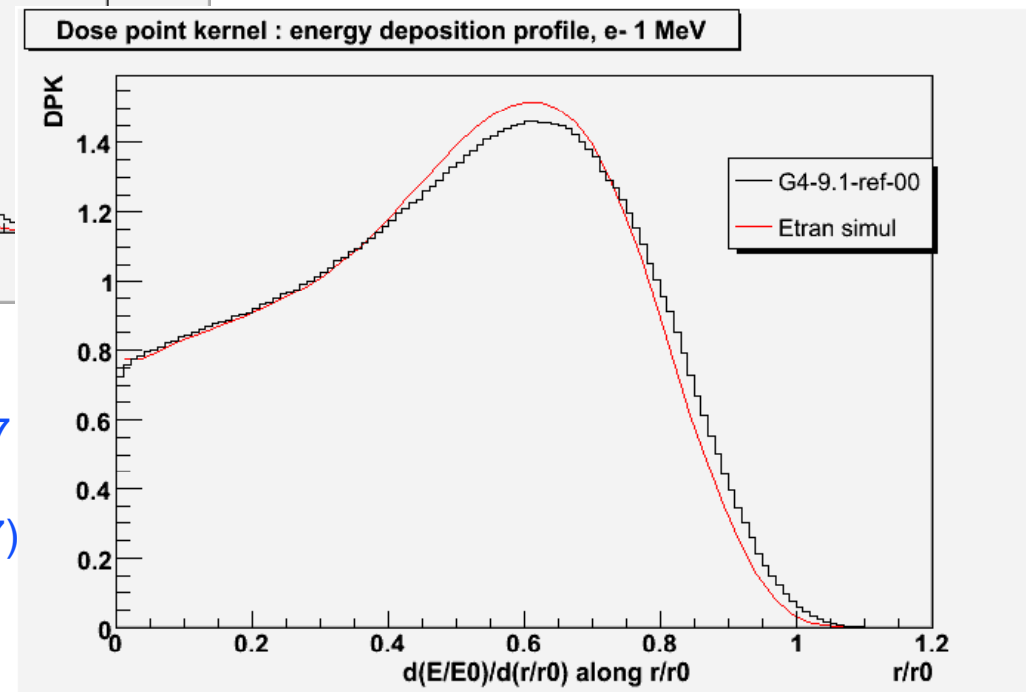
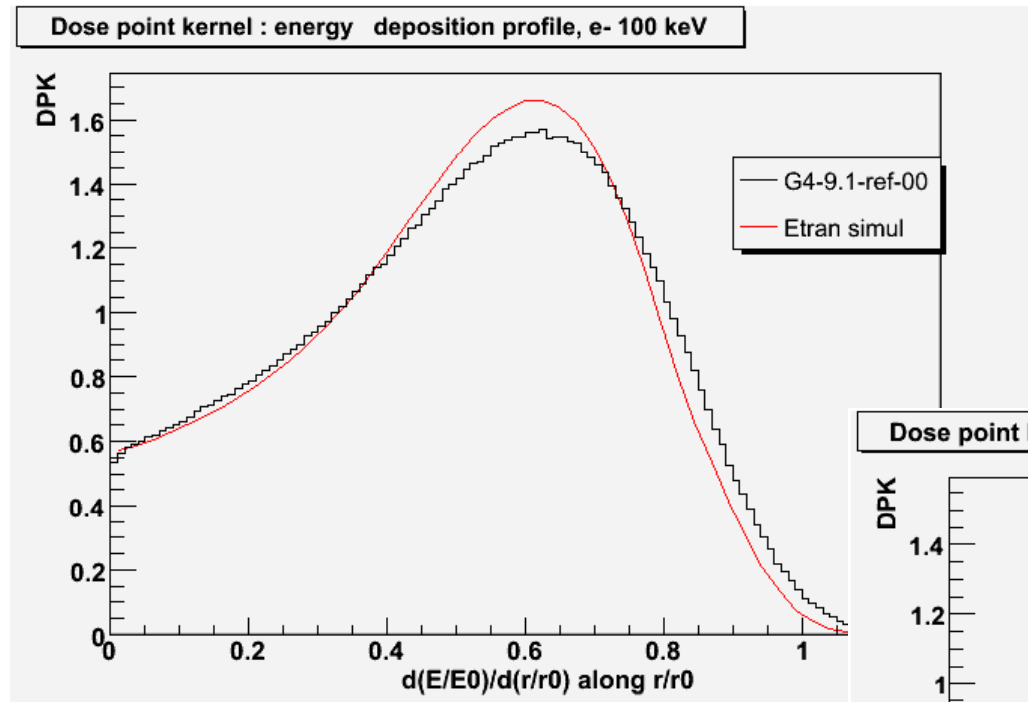
Depth dose distribution of 1000 keV e- in Ta



Sand79-0414.UC-34a (Feb.1987)

O.Kadri et al. MIN B 258 (2007) p.381

Em12/berger (1)

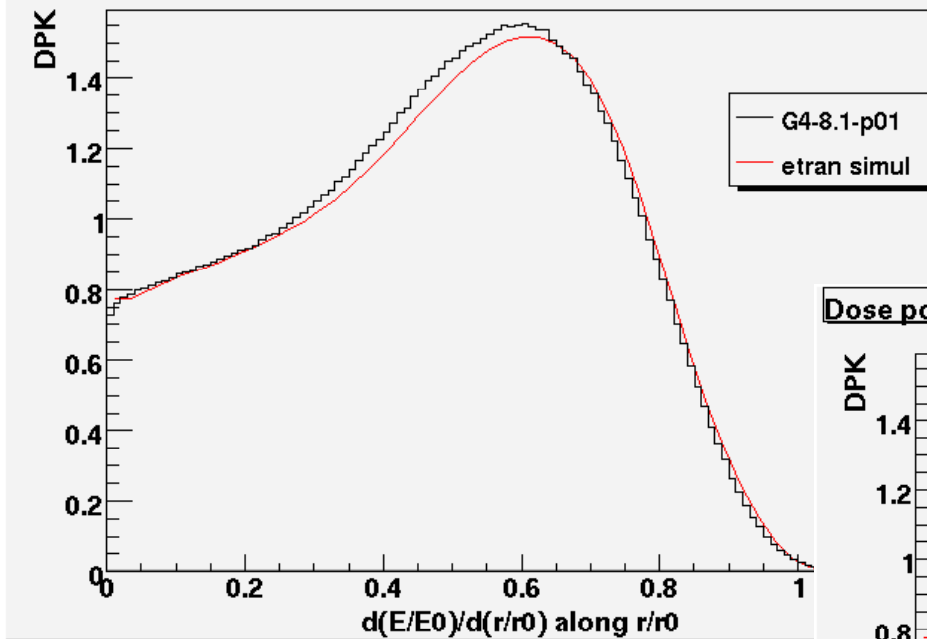


Seltzer Appl. Radiat. Isot. 42 (1991) p. 917

L. Ferrer et al Cancer Bio. Rad. 22-1 (2007)

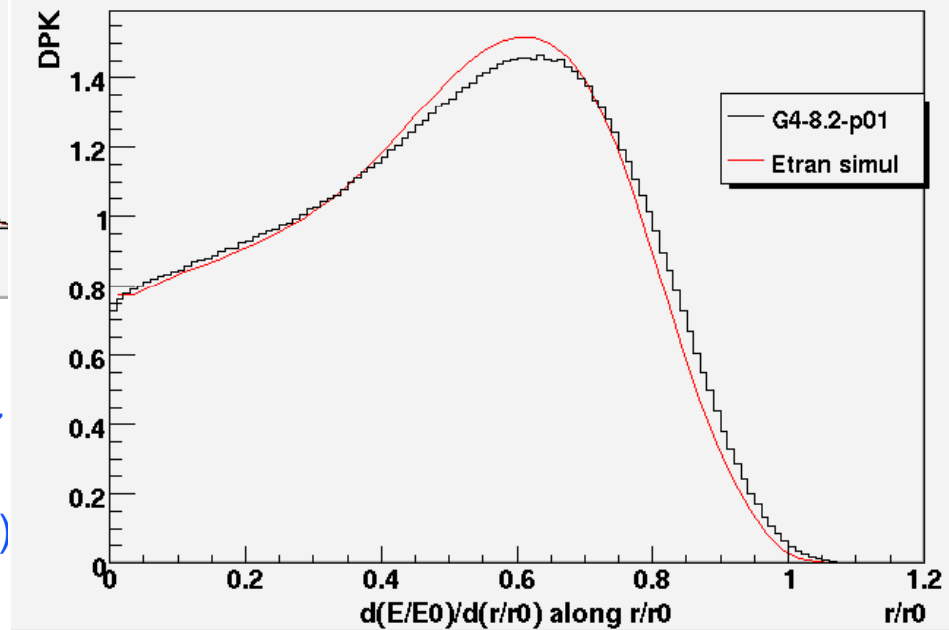
Em12/berger (2)

Dose point kernel : energy deposition profile, e- 1 MeV



G4 8.1 versus G4 8.2

Dose point kernel : energy deposition profile, e- 1 MeV



Seltzer Appl. Radiat. Isot. 42 (1991) p. 917

L. Ferrer et al Cancer Bio. Rad. 22-1 (2007)

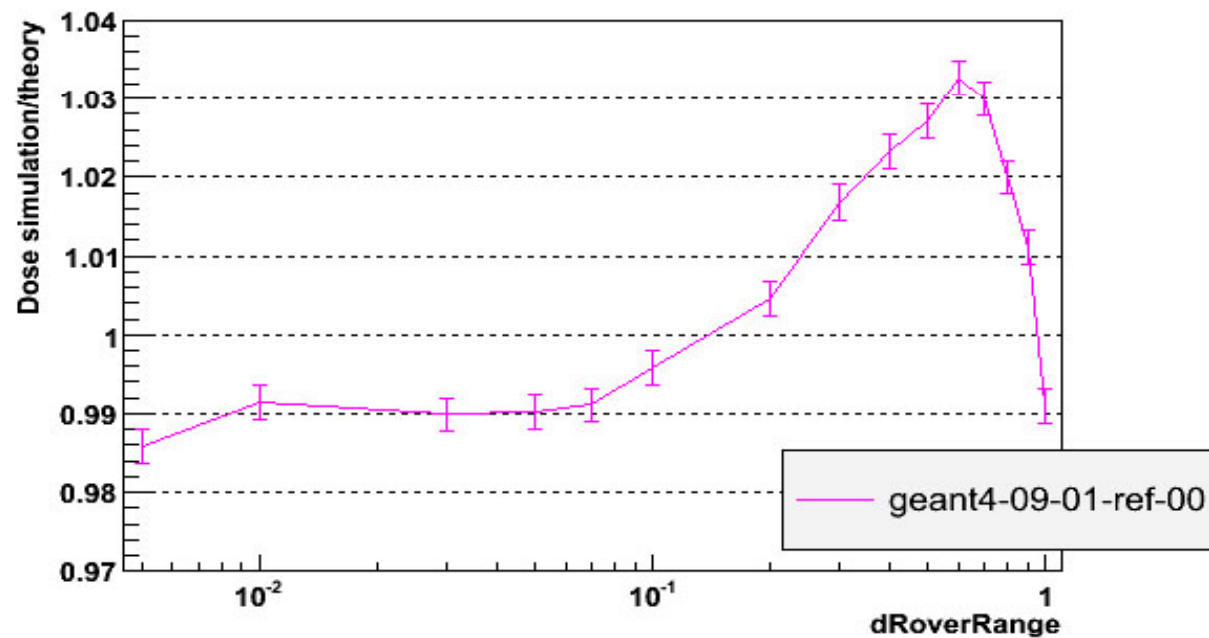
FanoCavity (1)

Fano cavity basic test case (no fluct, no msc) :

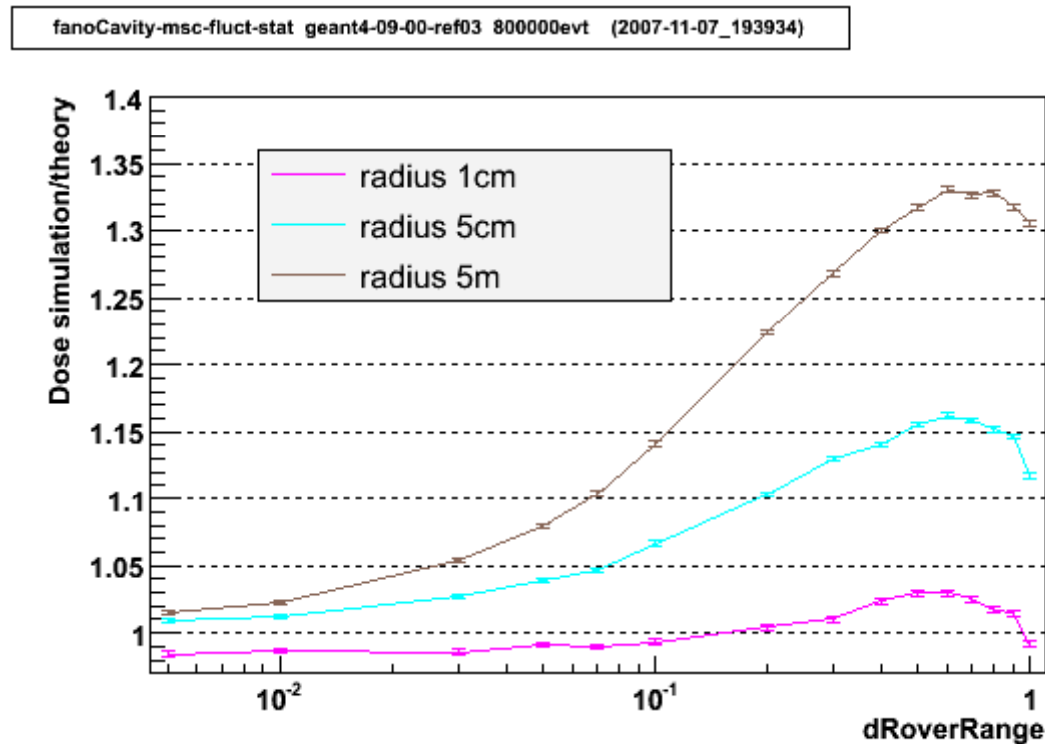
Ratio simul/theory = 1.00102 for dRoverRange=0.005

Fano cavity test case (fluct & msc) :

fanoCavity-msc-fluct-stat geant4-09-01-ref-00 800000evt (fano_2008-01-02_163537)

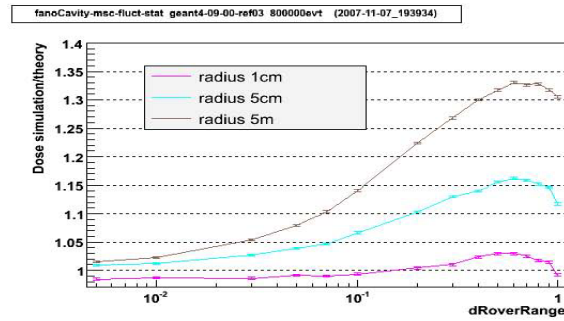


FanoCavity (2)



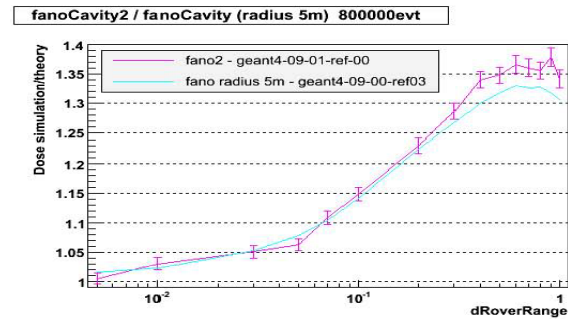
FanoCavity2 (3)

FanoCavity test case for different chamber radii :



FanoCavity test case (chamber radius 5m) / fanoCavity2 test case :

(fanoCavity2 is the test case based on Sempau's paper)



FanoCavity (4) : single scattering

