MSC configurations

14th Geant4 User and Collaboration Workshop
Catania (Italy) 19-23 October 2009

General discussion

Processes

- To avoid user confusions it is proposed to use processes per particle type:
  - G4eMultipleScattering for $e^{\pm}$
  - G4MuMultipleScattering for $\mu^{\pm}$
  - G4hMultipleScattering for hadrons and ions
- Mark G4MultipleScattering process as an obsolete
- Agree on the list of default models

Electrons/Positrons problem with Fano cavity

Fano2 cavity test case (opt3 EM options)

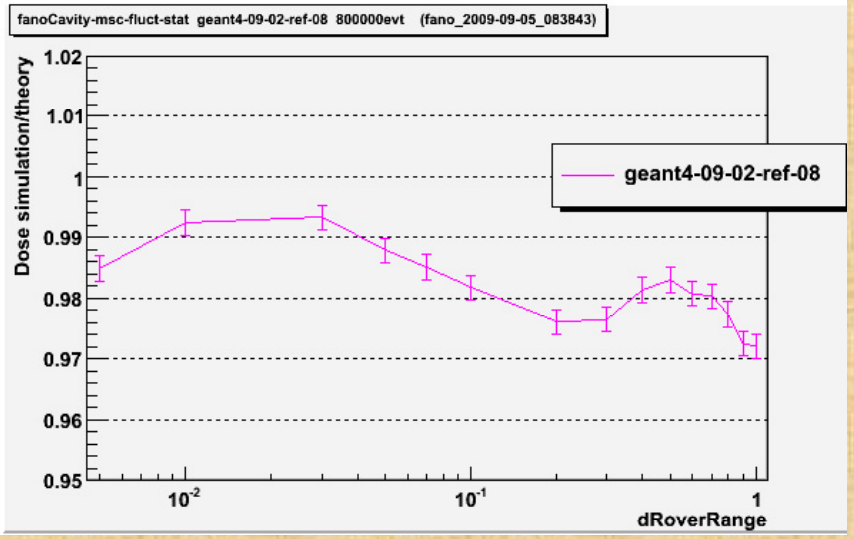
Ratio between simulated and theorical dose deposited by a 1.00 MeV electron beam crossing an infinite radius cavity

Geant4 release : 09-02-ref-08

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

Ratio simul/theory = 1.0009 for dRoverRange=0.005

Fano cavity test case (fluct & msc) :



Fano cavity test case (opt0 EM options)

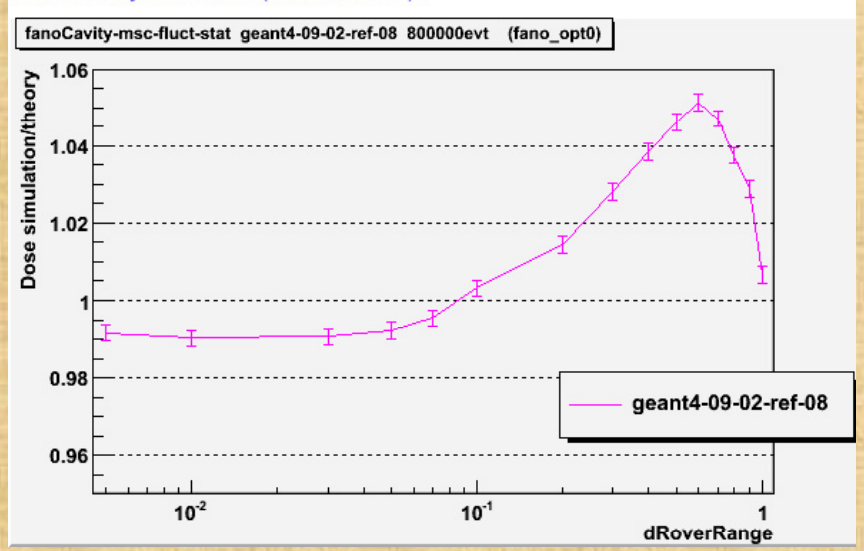
Ratio between simulated and theorical dose deposited by a 1.25 MeV photon beam crossing an ionization chamber

Geant4 release : 09-02-ref-08

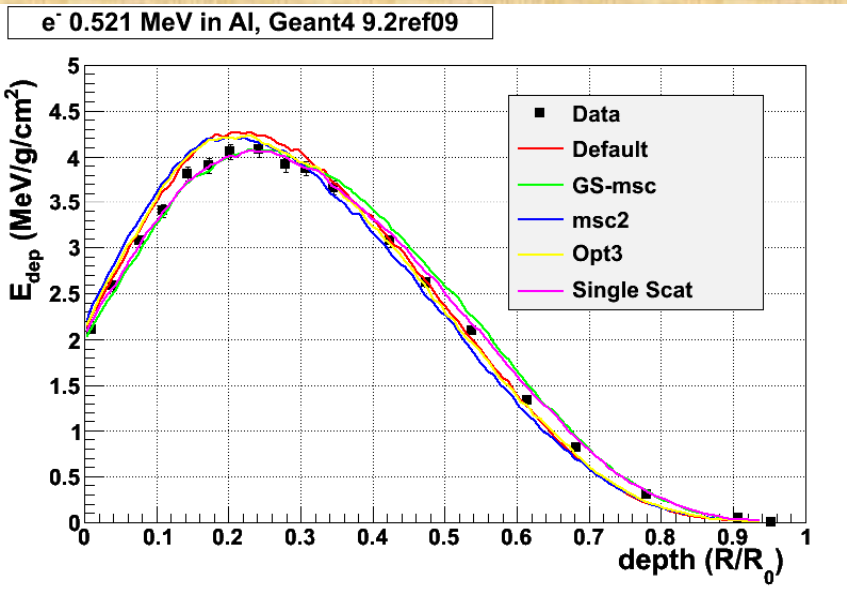
Fano cavity basic test case (no fluct, no msc) :

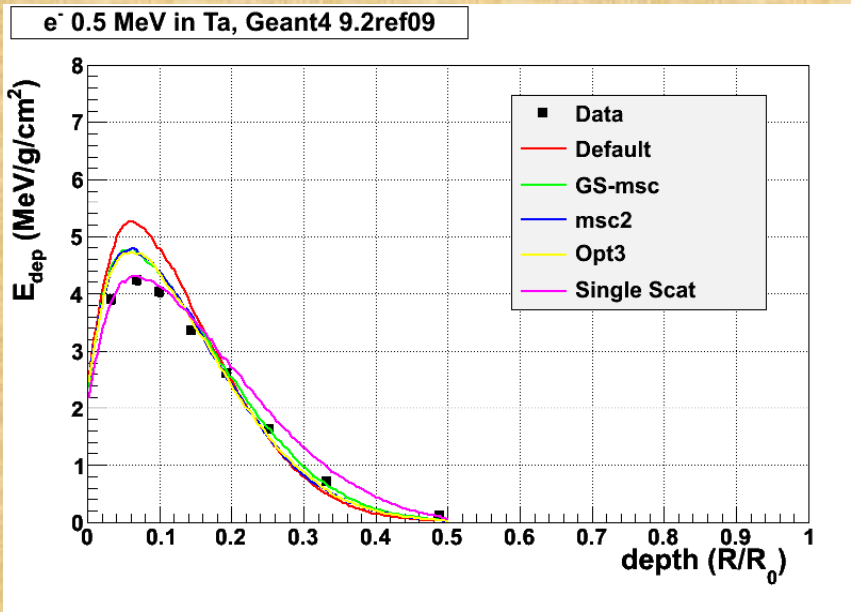
Ratio simul/theory = 1.0023 for dRoverRange=0.005

Fano cavity test case (fluct & msc) :



SANDIA data test



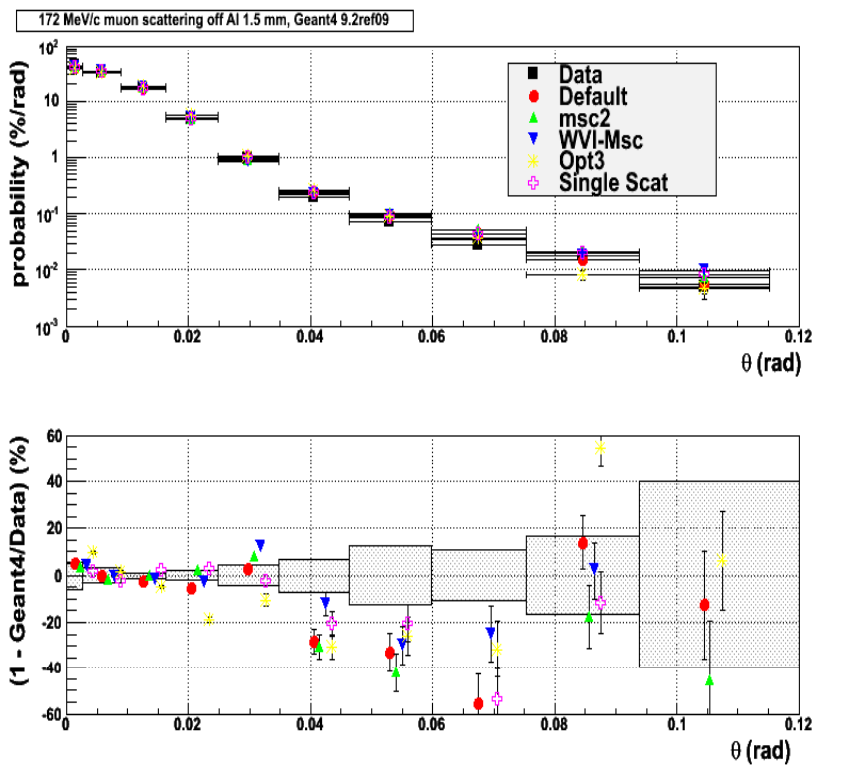


Electrons/Positrons proposal

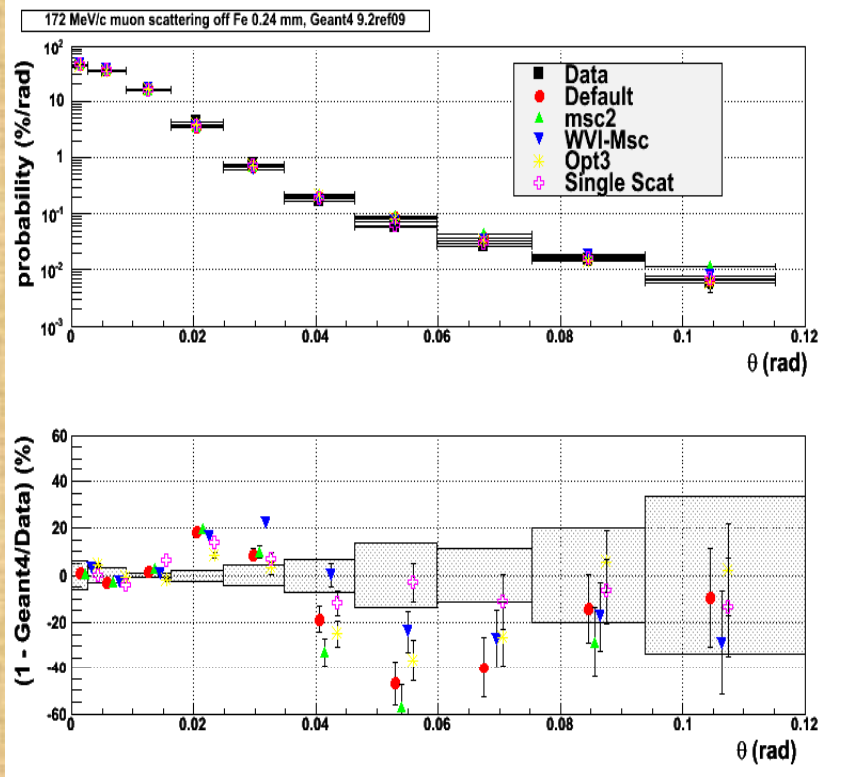
- G4UrbanMscModel (9.2 version):
  - G4EmStandardPhysics
  - G4EmStandardPhysics_option1
- G4UrbanMscModel2
  - G4EmStandardPhysics
  - G4EmStandardPhysics_option1
- G4GoudsmitSaundersonMscModel as option for extended examples:
  - TestEm5,
  - fanoCavity
  - electronScattering
  - Other benchmarks

MuScat benchmark

Aluminum

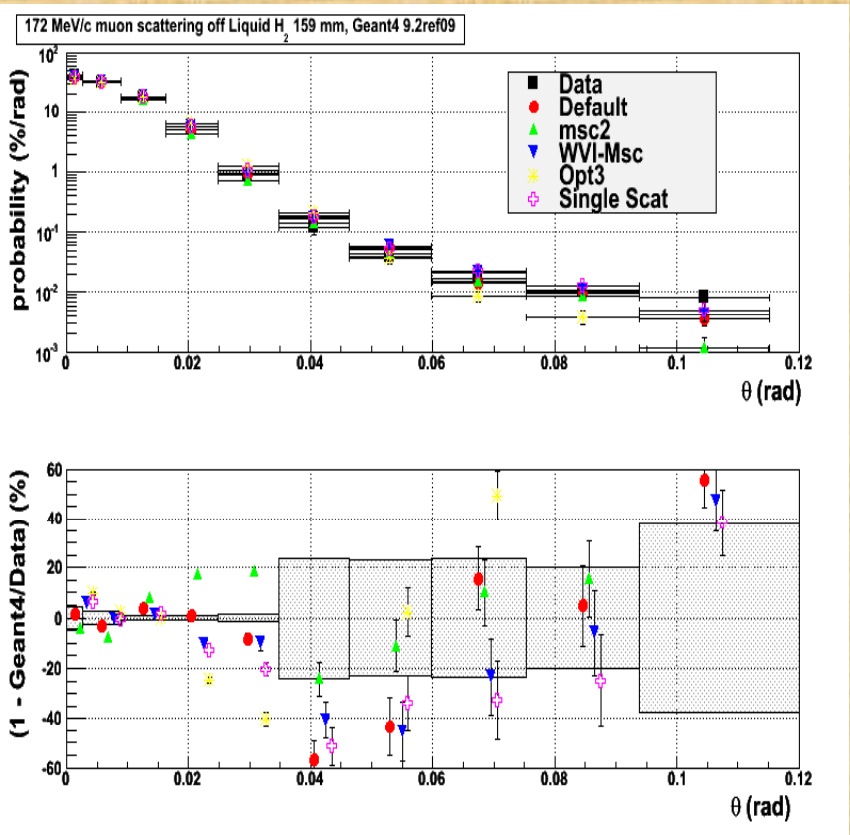


Iron

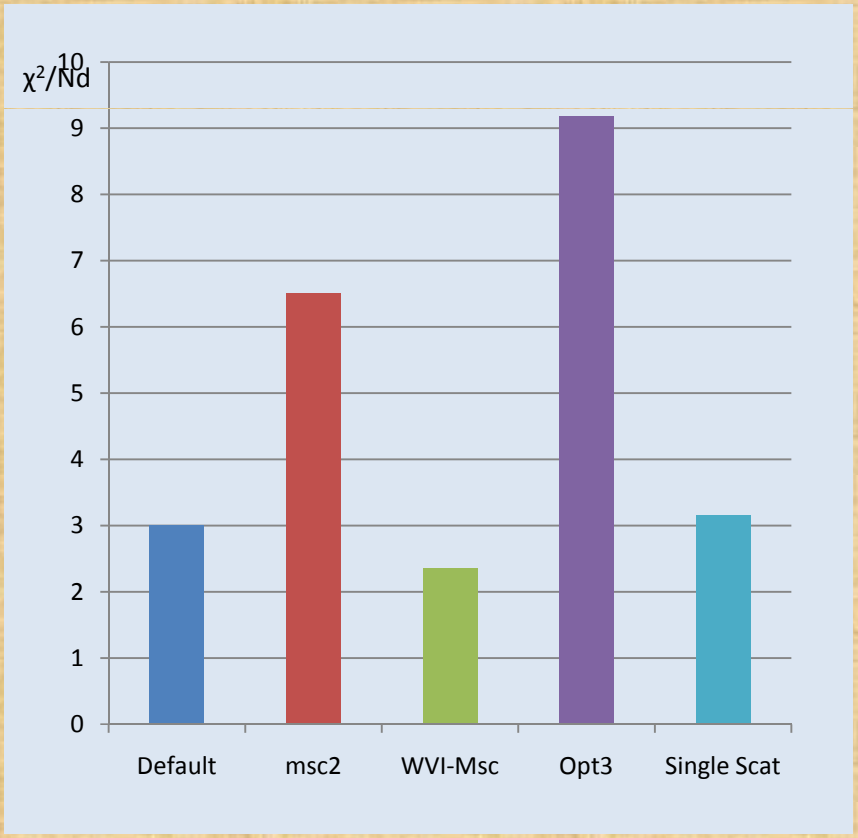


MuScat benchmark

Hydrogen



Sum over 10 targets



Muon-hadron proposal

- G4UrbanMscModel 90 (9.0 version):
  - All Physics Lists, all muons/hadrons except G4EmStandardPhysics_option2
- G4WentzelVIModel
  - G4EmStandardPhysics_option2 for muons
  - What about Opt3?
  - TestEm5,
  - benchmarks