Subject: Geant4: problem with set seed and cuts
Posted by Jerome Boucher on Tue, 06 Oct 2009 11:52:09 GMT
View Forum Message <> Reply to Message

Hi,

I would like to run the same simulation using different seeds. In case of Geant3, the function gRandom->SetSeed(seed) works fine. Concerning Geant4, this function has no effect.

The following method has been also tried. In the file gconfig/g4config.in, a line has been added:
/random/resetEngineFrom   full_path/seed.rnd
The file seed.rnd contains the seed value.
If I put 200345, I obtain:

Geant4 has been created.
 -I g4Config() using g4conf macro: /vol0/jerome/soft/pandaroot/trunk/gconfig/g4config.in

----- HepJamesRandom engine status -----
 Initial seed = 200345
 u[] = 0.174685 0.883674 0.958512 0.690013 0.0250537 0.142294 0.783649 0.356081
0.214774 0.69287 0.700302 0.465109 0.22215 0.768752 0.461089 0.397602 0.522215
0.121546 0.960227 0.510892 0.0116568 0.0286447 0.238777 0.585219 0.780612 0.709182
0.082106 0.828601 0.61446 0.0798209 0.688002 0.00978529 0.370831 0.376435 0.710184
0.864017 0.167338 0.21114 0.349235 0.522479 0.943713 0.0702708 0.778742 0.639458
0.506555 0.151751 0.990123 0.564688 0.430497 0.889832 0.995398 0.725368 0.710512
0.0550886 0.0540335 0.0159176 0.728379 0.947141 0.34922 0.20551 0.351029 0.672539
0.118976 0.655784 0.195375 0.0380308 0.293556 0.237497 0.79723 0.158375 0.029761
0.602215 0.616657 0.995638 0.734827 0.943425 0.130007 0.277064 0.306344 0.973337
0.183926 0.547536 0.914344 0.666572 0.210074 0.300351 0.83602 0.267525 0.248549
0.533332 0.1754 0.299529 0.538308 0.555472 0.283894 0.485254 0.222273
 c = 0.0216029, cd = 0.456233, cm = 1
 i97 = 96, u[i97] = 0.222273
 j97 = 32, u[j97] = 0.370831

So the seed seems to be loaded. But, doing two simulations using different seeds, results are identical.

Concerning the cuts, I tried to modify the cut (gconfig/SetCut.C file) from 1 MeV to 100 KeV. But this new value is not taken into account.

Someone has an idea where I'm wrong?

best regards

Jerome

Subject: Re: Geant4: problem with set seed and cuts
Posted by Mohammad Al-Turany on Wed, 07 Oct 2009 14:58:16 GMT
View Forum Message <> Reply to Message

Hi,

Can you try to use:

/random/setSeeds myseed myseed   ((G4 setSeeds requires at least two long values))

where myseed is the seed number you like.

the other method is normally used to restore the status of the random generator and need an input file which should contain the about 98 numbers presenting the HepJamesRandom engine status (it is a CLHEp package).

With the cuts, did you change anything in the g4Config.C? because the cuts will be used if your configuration has the option "stepLimiter+specialCuts+specialControls" setted in the TG4RunConfiguration. I tested the trunk version and using the macro/qa/QAmacro_sim_G4.C and get the following:

as it is:

-I- PndStack: Number of primaries   = 23
                 Total number of particles = 11514
              Number of tracks in output = 1938

now set the cutb in SetCuts.C to 1.0E-5

-I- PndStack: Number of primaries   = 23
           Total number of particles   = 22269
           Number of tracks in output   = 3967

so it seems to work! can you please control your g4Config.C ?

regards

Mohammad

Subject: Re: Geant4: problem with set seed and cuts
Posted by Jerome Boucher on Thu, 08 Oct 2009 08:54:39 GMT
View Forum Message <> Reply to Message

Hello!

I've tried the setSeeds method and it works

I checked the g4Config.C , the option "stepLimiter+specialCuts+specialControls" is setted. If I
looked to:-I- PndStack: the Total number of particles is changing according to my cut.

But if I look to the output it's always the same.

Index : 0   used in the geometry : Yes   recalculation needed : No
 Material : air
 Range cuts   : gamma 1 mm   e- 1 mm   e+ 1 mm
 Energy thresholds : gamma 990 eV   e- 990 eV   e+ 990 eV
 Region(s) which use this couple :
   DefaultRegionForTheWorld

Index : 1   used in the geometry : Yes   recalculation needed : No
 Material : aluminium
 Range cuts   : gamma 1 mm   e- 1 mm   e+ 1 mm
 Energy thresholds : gamma 6.88731 keV   e- 596.68 keV   e+ 568.011 keV
 Region(s) which use this couple :
   DefaultRegionForTheWorld

Index : 2   used in the geometry : Yes   recalculation needed : No
 Material : iron
 Range cuts   : gamma 1 mm   e- 1 mm   e+ 1 mm
 Energy thresholds : gamma 20.8323 keV   e- 1.28002 MeV   e+ 1.21851 MeV
 Region(s) which use this couple :
   DefaultRegionForTheWorld

Index : 3   used in the geometry : Yes   recalculation needed : No
 Material : copper
 Range cuts   : gamma 1 mm   e- 1 mm   e+ 1 mm
 Energy thresholds : gamma 24.6072 keV   e- 1.39521 MeV   e+ 1.31192 MeV
 Region(s) which use this couple :
   DefaultRegionForTheWorld

Index : 4   used in the geometry : Yes   recalculation needed : No
 Material : steel

Range cuts   : gamma 1 mm   e- 1 mm   e+ 1 mm
 Energy thresholds : gamma 20.8323 keV   e- 1.31192 MeV   e+ 1.23361 MeV
 Region(s) which use this couple :
   DefaultRegionForTheWorld

 Index : 5   used in the geometry : Yes   recalculation needed : No
 Material : vacuum
 Range cuts   : gamma 1 mm   e- 1 mm   e+ 1 mm
 Energy thresholds : gamma 990 eV   e- 990 eV   e+ 990 eV
 Region(s) which use this couple :
   DefaultRegionForTheWorld

 Index : 6   used in the geometry : Yes   recalculation needed : No
 Material : Al+Be
 Range cuts   : gamma 1 mm   e- 1 mm   e+ 1 mm
 Energy thresholds : gamma 4.45676 keV   e- 496.074 keV   e+ 478.087 keV
 Region(s) which use this couple :
   DefaultRegionForTheWorld

 Index : 7   used in the geometry : Yes   recalculation needed : No
 Material : TPCmixture
 Range cuts   : gamma 1 mm   e- 1 mm   e+ 1 mm
 Energy thresholds : gamma 990 eV   e- 990 eV   e+ 990 eV
 Region(s) which use this couple :
   DefaultRegionForTheWorld

 Index : 8   used in the geometry : Yes   recalculation needed : No
 Material : silicon
 Range cuts   : gamma 1 mm   e- 1 mm   e+ 1 mm
 Energy thresholds : gamma 6.88731 keV   e- 540.718 keV   e+ 521.113 keV
 Region(s) which use this couple :
   DefaultRegionForTheWorld

 Index : 9   used in the geometry : Yes   recalculation needed : No
 Material : carbon
 Range cuts   : gamma 1 mm   e- 1 mm   e+ 1 mm
 Energy thresholds : gamma 3.29462 keV   e- 568.011 keV   e+ 554.196 keV
 Region(s) which use this couple :
   DefaultRegionForTheWorld

...

Could you explain me why?

best regards

jeorme

Subject: Re: Geant4: problem with set seed and cuts
Posted by Mohammad Al-Turany on Thu, 08 Oct 2009 09:15:35 GMT
View Forum Message <> Reply to Message

Hi,

This comes because the concept of cuts in G3/G4 is different, in VMC these cuts are tracking cuts, they are there to make it possible to compare the results of G3/G4.

In the new release of VMC you can also apply them to G4 and they can behave more or less like the G3 one and then you will see also the difference in the output.

regards

Mohammad

Subject: Re: Geant4: problem with set seed and cuts
Posted by Mohammad Al-Turany on Thu, 08 Oct 2009 15:22:59 GMT
View Forum Message <> Reply to Message

Hallo,

I just modified the g4Config.C in a way that G4 use by default the values you set in gRandom in your simulation macro. (svn r 6707) so from this release it is not needed any more to change the g4config.in or use the previous way described in this forum. G4/G3 use the same seed from gRandom.

regards

Mohammad

Subject: Re: Geant4: problem with set seed and cuts
Posted by Dmitry Khaneft on Fri, 09 Oct 2009 11:47:54 GMT
View Forum Message <> Reply to Message

Thanks a lot!

Subject: Re: Geant4: problem with set seed and cuts
Posted by Jerome Boucher on Mon, 19 Oct 2009 10:29:24 GMT
View Forum Message <> Reply to Message

Hi!

Sorry for the late answer, I was fighting with my laptop...

I tried the gRandom->SetSeed(seed) with the revision you specified but it seems that there is no effect.
I added a line in the g4Config.C to print out the buffer and it is correctly filled.

best regards
 jerome