Subject: Geant4 floating point exception
Posted by Sebastian Neubert on Wed, 01 Aug 2007 10:07:57 GMT
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Hi!

I tried to simulate lambdas (generated with EvtGen) and I get the following error. Any idea?

Program received signal SIGFPE, Arithmetic exception.
[Switching to Thread -1235704640 (LWP 29419)]
0xb29d8b6f in G4UrbanMscModel::SampleCosineTheta ()
  from /afs/e18/panda/SIM/FAIRRoot/cbmsoft/transport/geant4/lib/Linux-g++/libG4emstandard.so
(gdb) bt
#0 0xb29d8b6f in G4UrbanMscModel::SampleCosineTheta ()
  from /afs/e18/panda/SIM/FAIRRoot/cbmsoft/transport/geant4/lib/Linux-g++/libG4emstandard.so
#1 0xb29d8732 in G4UrbanMscModel::SampleSecondaries ()
  from /afs/e18/panda/SIM/FAIRRoot/cbmsoft/transport/geant4/lib/Linux-g++/libG4emstandard.so
#2 0xb2a6dd86 in G4VMultipleScattering::PostStepDoIt ()
  from /afs/e18/panda/SIM/FAIRRoot/cbmsoft/transport/geant4/lib/Linux-g++/libG4 emutils.so
#3 0xb173432b in G4SteppingManager::InvokePSDIP ()
  from /afs/e18/panda/SIM/FAIRRoot/cbmsoft/transport/geant4/lib/Linux-g++/libG4 tracking.so
#4 0xb173429f in G4SteppingManager::InvokePostStepDoItProcs ()
  from /afs/e18/panda/SIM/FAIRRoot/cbmsoft/transport/geant4/lib/Linux-g++/libG4 tracking.so
#5 0xb1731efa in G4SteppingManager::Stepping ()

Cheers! Sebastian.

Subject: Re: Geant4 floating point exception
Posted by StefanoSpataro on Wed, 01 Aug 2007 10:11:30 GMT
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Why do you use geant4?

Subject: Re: Geant4 floating point exception
Posted by asanchez on Wed, 01 Aug 2007 10:38:24 GMT
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Hi Sebastian,
i have actually the same problem.
It seems that there is some problem with the geant4 physics
process. Try to run with the geant3. it works.

cheers alicia.

Subject: Re: Geant4 floating point exception
Posted by asanchez on Wed, 01 Aug 2007 10:42:21 GMT
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yes it is known that geant4 doesn't work properly here, but
that is not excuse to exclude it from the software.

I think this problem should anyway be solved, so we can work
with both, geant3 and geant4.

Alicia.

Subject: Re: Geant4 floating point exception
Posted by Florian Uhlig on Wed, 01 Aug 2007 11:04:35 GMT
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Hi

This is a bug already reported by Alicia. The problem is that the
bug is not in our code.
I will try to locate the bug and send a bug report to the GEANT4
team. Maybe there is a workaround but it is always hard to change something in the transport, because you can easily introduce a lot of errors by your changes.

Ciao

Florian

Subject: Re: Geant4 floating point exception
Posted by Sebastian Neubert on Wed, 01 Aug 2007 11:07:35 GMT
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Hi!

I do not want to start a discussion wether G3 or G4 should be used. We want to have both, so we have to make it to work.
However I am (sort of) glad that I am not the only one who has that problem!

CU! Sebastian.

Subject: Re: Geant4 floating point exception
Posted by StefanoSpataro on Wed, 01 Aug 2007 11:50:44 GMT
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The point of my answer (but not written) was:

Our VirtualMC has problems with G4 lists, the only persons that can change the code are from outside the collaboration, so we cannot operate in this sense, just report to them and wait (and this was done).

And in our external packages the data directories where completely missing, and we do not know how it affects our data.

Meanwhile there are two new versions of virtualMC, that require new external packages (such as geant4 9.0), so in some sense our code for g4 is obsolete. The update takes some time and it is not already planned, because it requires some tests.

So with our release it is better to use only G3, at the moment. This will changed hopefully in the next future, but it does not depend only from us. We are the only hep experiment which is using the virtualMC geant4, so we are the "beta tester".

Subject: Re: Geant4 floating point exception
Posted by Sebastian Neubert on Wed, 01 Aug 2007 12:09:22 GMT
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Hi!

The error message I posted has nothing to do with the VMC interface (at least I would be extremely surprised) When you look into the respective G4 class you will notice, that there are simply a lot of divisions where there is no check for division by 0. I guess that is where the problem comes in.

I have done all studies so far with G4, so I do not see why it should be impossible. Furthermore the complete code is in our hands. If the community is not fast enough we have to look ourselves. At least try to.
I guess that there are people in Panda that are adept enough to debug G4!?

Regards, Sebastian.

Subject: Re: Geant4 floating point exception
Posted by Florian Uhlig on Wed, 01 Aug 2007 12:23:13 GMT
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Hi Sebastian

> Furthermore the complete code is in our hands. If the
> community is not fast enough we have to look ourselves. At
> least try to.
> I guess that there are people in Panda that are adept enough
> to debug G4!?

This is true, but it is always not easy to change parts of the
simulation code because you never can know what are the side
effects. You need at least a litle bit of overview.
For example in your case there are a lot of pssible divisions by zero. The problem is now what to do in such a case. If i set
the variable to some value i have to understand what could be the effect of that change.

Ciao

Florian

Subject: Re: Geant4 floating point exception
Posted by Sebastian Neubert on Wed, 01 Aug 2007 12:53:16 GMT
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Hi!

ok, I put some assertions into G4 and indeed it is a division by 0 bug. I'll have a look at this and try to understand
a) how this can happen at all
b) how to do a fix

>>> Event 83
root.exe: src/G4UrbanMscModel.cc:913: G4double
G4UrbanMscModel::SampleCosineTheta(double, double): Assertion `tau!=0' failed.

CU! Sebastian.

Subject: Hypernuclei simulation status
Posted by asanchez on Wed, 01 Aug 2007 12:58:13 GMT
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hi, i'm still having problems to connect.
From my side,
i wanted to say that the tracking and identification of low kaons seems to be feasible for the tpc and the tof detector.

Unfortunally i can not extract the reconstructed information from the tpc
because Sebastian is still working on.

I have extracted the moementum and the length of the trayectory by myself(helix parametrization ,of course it is an ideal case).
But i will wait till the tpc is able to produce some information from the tracking, to study what is the expected resolution for the low kaon identification(tof).

Here attached i send you some moemnta distributions

in which kaons and the pions distributions (coming from antiXi- annihilation) are plotted.
thetPK.eps(kaonon P vs polar angle) and thetPP.eps(pion P vs polar angle)

The only requirement which has to be filled by them, is that both particles have to have a transversal moemnta larger than 300 MeV in order to reach the tof detector + tpc region. The tranversal moemntum distribution of both particles are plotted also together.See ptKP.eps

I'm still working on the Secondary target(silicon strips) and on the HPGE cluster detector digitization.

I want also in the next weeks to finish the implementation
of the Hypernuclei generator, and maybe to start to work on the reconstruction.

I will commit as soon as possible the tof detector.

OK, i hope that can be helpful.

cheers ALicia.

File Attachments

1) thetPK.eps, downloaded 575 times
2) ptKP.eps, downloaded 539 times
3) thetPP.eps, downloaded 562 times

Subject: Re: Geant4 floating point exception
Posted by StefanoSpataro on Wed, 01 Aug 2007 13:06:03 GMT
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In each case our g4 code (8.2) is not the latest one,
the last is 9.0.
So one should check if this was corrected in the new release.

Subject: Re: Geant4 floating point exception
Posted by Sebastian Neubert on Wed, 01 Aug 2007 13:39:26 GMT
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Hi Stephano!

I am checking G4.9.0. Will get back to you when I have a conclusion if this helps.

Cheers! Sebastian.

Subject: Re: Geant4 floating point exception
Posted by Florian Uhlig on Thu, 02 Aug 2007 08:52:00 GMT
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Hi Sebastian

I also check G4 9.0. There are indeed some changes in G4UrbanMscModel.cc, even one concerning the SampleTheta function.
In a first try i only backportet this changes, but this doesn't help. I still get the same error.
I will now install G4 9.0 here at GSI and try to run with the new
version.

Ciao

Florian

Subject: Re: Geant4 floating point exception
Posted by asanchez on Thu, 02 Aug 2007 09:24:49 GMT
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hi
what is going now this morning?

i get this error
lxg0310:build>. config.sh
-bash: /misc/cbmsoft/Debian3.1/debug/transport/geant4/env.sh: No such file or directory

see below,

lxg0310:build>cmake ../pandaroot/
-- You're using the GSI installation of the external packages.
-- This is an 32 bit machine
-- Found root of the simulation software at /misc/cbmsoft/Debian3.1/new
-- Looking for Root...
-- Looking for Root... - found /misc/cbmsoft/Debian3.1/new/tools/root/bin/root
-- Looking for Root... - version 5.14/00
-- Looking for GEANT3...
-- Looking for GEANT3... - found
/misc/cbmsoft/Debian3.1/debug/transport/geant3/lib/tgt_linux/libgeant321 .so
-- Looking for Pluto...
-- Looking for Pluto... - found /misc/cbmsoft/Debian3.1/debug/generators/lib
-- Looking for Pythia6...
-- Looking for Pythia6... - found /misc/cbmsoft/Debian3.1/debug/generators/lib
-- Looking for GEANT4...
-- Looking for GEANT4... - found
/misc/cbmsoft/Debian3.1/debug/transport/geant4/lib/Linux-g++
-- Looking for GEANT4VMC...
-- Looking for GEANT4VMC... - found
/misc/cbmsoft/Debian3.1/debug/transport/geant4_vmc/lib/tgt_linux
-- Looking for VGM...
-- Looking for VGM... - found /misc/cbmsoft/Debian3.1/debug/transport/vgm/lib/Linux-g++
-- Looking for CLHEP...
-- Looking for CLHEP... - found /misc/cbmsoft/Debian3.1/debug/cern/clhep/lib
-- Configuring done

-- Generating done
-- Build files have been written to: /u/asanchez/fairroot_prueba/build
lxg0310:build>. config.sh
-bash: /misc/cbmsoft/Debian3.1/debug/transport/geant4/env.sh: No such file or directory
lxg0310:build>

Subject: Re: Geant4 floating point exception
Posted by Sebastian Neubert on Thu, 02 Aug 2007 09:30:03 GMT
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Hi florian!

I came to the samer conclusion concerning the UrbanMsc.
I tried to just run G4 4.9 yesterday, but somehow the libraries seemed to have changed. I got some dynamic link problems.

Then I looked a little bit closer to the UrbanMsc and I found out that the error occurs when

a) the steplength is smaller than stepmin (in ComputeGeomPathLength)

and

b) the steplength is larger than 0.05*currrentRange (in SampleCosineTheta)

This surely appears to be an exotic case, but it leads to an inconsistency in the calculation of tau which culminates in a division by zero.

I have to admit that I can only guess what all the variables mean. So at the moment I have to think about what would be a reasonable fix.

Cheers! Sebastian.

Subject: Re: Geant4 floating point exception
Posted by Florian Uhlig on Thu, 02 Aug 2007 09:39:56 GMT
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Hi Alicia

Please use

```
export SIMPATH=/misc/cbmsoft/Debian3.1/new
```

and go on.
I am installing at /misc/cbmsoft/Debian3.1/debug the newest GEANT4 version. That's why you can't find the file.

Ciao

Florian

Subject: Re: Geant4 floating point exception
Posted by asanchez on Thu, 02 Aug 2007 09:45:32 GMT
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Yes fine,
but maybe the next time
is it better to inform previosly when you attend to change somethimg which can influence the ongoing work of the rest of the people using the gsi installation.

cheers Alicia.

Subject: Re: Geant4 floating point exception
Posted by asanchez on Thu, 02 Aug 2007 09:48:14 GMT
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hi again, sorry but it doesn't work.

the path is the same that i had before.

lxg0310:build>more config.sh
export SIMPATH=/misc/cbmsoft/Debian3.1/new
export ROOTSYS=/misc/cbmsoft/Debian3.1/new/tools/root
export GEANT4_LIBRARY_DIR=/misc/cbmsoft/Debian3.1/debug/transport/geant4/lib/Li
nux-g++
export GEANT4_INCLUDE_DIR=/misc/cbmsoft/Debian3.1/new/transport/geant4/include:
/misc/cbmsoft/Debian3.1/new/transport/geant4/source/interfa
 ces/common/include:/misc/cbmsoft/Debian3.1/new/transport/geant4/physics_
lists/hadronic/Packaging/include:/misc/cbmsoft/Debian3.1/new/trans
port/geant4/physics_lists/hadronic/QGSP/include
export GEANT4VMC_INCLUDE_DIR=/misc/cbmsoft/Debian3.1/new/transport/geant4_vmc/s
ource/global/include:/misc/cbmsoft/Debian3.1/new/transport/
 geant4_vmc/source/geometry/include:/misc/cbmsoft/Debian3.1/new/transport
/geant4_vmc/source/digits+hits/include:/misc/cbmsoft/Debian3.1/new
 /transport/geant4_vmc/source/physics/include:/misc/cbmsoft/Debian3.1/new
/transport/geant4_vmc/source/event/include:/misc/cbmsoft/Debian3.1
 /new/transport/geant4_vmc/source/run/include:/misc/cbmsoft/Debian3.1/new
/transport/geant4_vmc/source/interfaces/include:/misc/cbmsoft/Debi
 an3.1/new/transport/geant4_vmc/source/visualization/include:/misc/cbmsof
t/Debian3.1/new/transport/geant4_vmc/include:/misc/cbmsoft/Debian3
 .1/new/transport/vgm/packages/BaseVGM/include:/misc/cbmsoft/Debian3.1/ne
w/transport/vgm/packages/ClhepVGM/include:/misc/cbmsoft/Debian3.1/
 new/transport/vgm/packages/Geant4GM/include:/misc/cbmsoft/Debian3.1/new/
transport/vgm/packages/RootGM/include:/misc/cbmsoft/Debian3.1/new/
 transport/vgm/packages/VGM/include:/misc/cbmsoft/Debian3.1/new/transport
/vgm/packages/XmlVGM/include

```
export  GEANT4VMC_LIBRARY_DIR=/misc/cbmsoft/Debian3.1/debug/transport/geant4_vmc
/lib/tgt_linux
export CLHEP_INCLUDE_DIR=/misc/cbmsoft/Debian3.1/new/cern/clhep/include
export CLHEP_LIBRARY_DIR=/misc/cbmsoft/Debian3.1/debug/cern/clhep/lib
export PLUTO_LIBRARY_DIR=/misc/cbmsoft/Debian3.1/debug/generators/lib
export PLUTO_INCLUDE_DIR=/misc/cbmsoft/Debian3.1/debug/generators/pluto/src
export G3SYS=/misc/cbmsoft/Debian3.1/debug/transport/geant3
export  GEANT3_INCLUDE_DIR=/misc/cbmsoft/Debian3.1/debug/transport/geant3/TGeant 3
export  GEANT3_LIBRARY_DIR=/misc/cbmsoft/Debian3.1/debug/transport/geant3/lib/tg
t_linux
export ROOT_LIBRARY_DIR=/misc/cbmsoft/Debian3.1/new/tools/root/lib
export ROOT_INCLUDE_DIR=/misc/cbmsoft/Debian3.1/new/tools/root/include
export VMCWORKDIR=/u/asanchez/fairroot_prueba/pandaroot
export CBMLIBDIR=/u/asanchez/fairroot_prueba/build/lib
export  LD_LIBRARY_PATH=/usr/lib:/usr/X11R6/lib:/u/asanchez/fairroot_prueba/buil
d/lib:/misc/cbmsoft/Debian3.1/new/tools/root/lib:/misc/cbms
 oft/Debian3.1/debug/transport/geant3/lib/tgt_linux:/misc/cbmsoft/Debian3
.1/debug/generators/lib:/misc/cbmsoft/Debian3.1/debug/generators/l
 ib:/misc/cbmsoft/Debian3.1/debug/transport/geant4/lib/Linux-g++:/misc/cb
msoft/Debian3.1/debug/transport/geant4_vmc/lib/tgt_linux:/misc/cbm
 soft/Debian3.1/debug/transport/vgm/lib/Linux-g++:/misc/cbmsoft/Debian3.1
/debug/cern/clhep/lib
lxg0310:build> export SIMPATH=/misc/cbmsoft/Debian3.1/new
lxg0310:build>
lxg0310:build>
lxg0310:build>
lxg0310:build>. config.sh
-bash: /misc/cbmsoft/Debian3.1/debug/transport/geant4/env.sh: No such file or directory
lxg0310:build>
```

Subject: Re: Geant4 floating point exception
Posted by Florian Uhlig on Thu, 02 Aug 2007 10:15:29 GMT
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Hi Alicia

This is my private working directory which was not intended to
be used in a normal all day use. This directory should only be used if you have problems and want really to know where your program crashes in our external packages.

So please use normaly the SIMPATH set to

/misc/cbmsoft/Debian3.1/new

which are exactely the same packages but without debug information.

Ciao

Florian

Subject: Re: Geant4 floating point exception
Posted by Florian Uhlig on Thu, 02 Aug 2007 10:18:54 GMT
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Hi Alicia

Did you create the config.sh script again after you export the SIMPATH?

Ciao

Florian

Subject: Re: Geant4 floating point exception
Posted by asanchez on Thu, 02 Aug 2007 10:42:15 GMT
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yes
does it means that i don't have to?

cheers ALicia.

Subject: Re: Geant4 floating point exception
Posted by Florian Uhlig on Thu, 02 Aug 2007 11:48:11 GMT
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Hi

Yes you have to.

I checked and there was a small problem in one of the cmake files. Please run an svn update in

pandaroot/cmake/modules and run cmake again. Then everything
should be fine.

Ciao

Subject: Re: Geant4 floating point exception
Posted by asanchez on Thu, 02 Aug 2007 11:54:20 GMT
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hi

Ok thanks.
alicia.

Subject: Re: Geant4 floating point exception
Posted by Florian Uhlig on Thu, 02 Aug 2007 16:15:11 GMT
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Hi Sebastian

> I tried to just run G4 4.9 yesterday, but somehow the
> libraries seemed to have changed. I got some dynamic link
> problems.

This can be solved in changing the order of the libraries in gconfig/g4libs.
The real problem is that geant4 don't run with root 5.14.00 but
needs root 5.16.00 which envorces big changes in the framework.
So the step to geant4 9.0 is not easy to make.

> Then I looked a little bit closer to the UrbanMsc and I found > out that the error occurs when

> a) the steplength is smaller than stepmin (in
> ComputeGeomPathLength)

> and

> b) the steplength is larger than 0.05*currrentRange (in
> SampleCosineTheta)

I will try to ask the GEANT4 people for advice.

Ciao

Florian
