Subject: Crash in DIRC with G4
Posted by StefanoSpataro on Wed, 18 Jan 2012 17:24:21 GMT
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Hi,
I have tried to run DIRC simulation with G4 and I have the following crash:

Toggle Spoilerspataro@briareos:~/jan12/pandaroot/macro/drc$ rt sim_dirc.C
root [0]
Processing sim_dirc.C...
Warning in <TClassTable::Add>: class PndSdsMCPoint already in TClassTable
Warning in <TClassTable::Add>: class PndSdsStrip already in TClassTable
Warning in <TClassTable::Add>: class PndSdsDigi already in TClassTable
Warning in <TClassTable::Add>: class PndSdsDetector already in TClassTable
[INFO] Media file used : /home/spataro/jan12/pandaroot/geometry/media_pnd.geo
[INFO] ============== FairRunSim: Initialising simulation run ==============
Info in <TGeoManager::TGeoManager>: Geometry FAIRGeom, FAIR geometry created
-I- FairGeoMedia Read media
[INFO] Create visualisation manager
Loading Geant4 global libraries ...Our Macro
Loading Library libG4Tree
Loading Library libG4FR
Loading Library libG4GMocren
Loading Library libG4visHepRep
Loading Library libG4RayTracer
Loading Library libG4VRML
Loading Library libG4vis_management
Loading Library libG4modeling
Loading Library libG4interfaces
Loading Library libG4persistency
Loading Library libG4analysis
Loading Library libG4error_propagation
Loading Library libG4readout
Loading Library libG4physicslists
Loading Library libG4run
Loading Library libG4event
Loading Library libG4tracking
Loading Library libG4parmodels
Loading Library libG4processes
Loading Library libG4digits_hits
Loading Library libG4track
Loading Library libG4particles
Loading Library libG4geometry
Loading Library libG4materials
Loading Library libG4graphics_reps
Loading Library libG4intercoms
Loading Library libG4global
Loading Library libG4clhep
Loading VGM libraries ...
Loading g4root library ...
Loading libraries ... finished
Info in <TGeoManager::SetTopVolume>: Top volume is cave. Master volume is cave

```
Info in <TGeoNavigator::BuildCache>: --- Maximum geometry depth set to 100
<I> PndPipe - Using default geometry

 =======  DRC::  ConstructGeometry()  ========
 ===========================================
 ===========================================
Info in <TGeoManager::CheckGeometry>: Fixing runtime shapes...
Info in <TGeoManager::CheckGeometry>: ...Nothing to fix
Info in <TGeoManager::CloseGeometry>: Counting nodes...
Info in <TGeoManager::Voxelize>: Voxelizing...
Info in <TGeoManager::CloseGeometry>: Building cache...
Info in <TGeoManager::CloseGeometry>: 207 nodes/ 19 volume UID's in FAIR geometry
Info in <TGeoManager::CloseGeometry>: ----------------modeler ready----------------
Info in <TG4RootNavMgr::SetNavigator>: TG4RootNavigator created and registered to
G4TransportationManager
Running TVirtualMCApplication::ConstructGeometry
*************************************************************
 Geant4 version Name: geant4-09-05-ref-00    (2-December-2011)
                      Copyright : Geant4 Collaboration
                      Reference : NIM A 506 (2003), 250-303
                            WWW : http://cern.ch/geant4
*************************************************************

Info in <TG4RootNavMgr::Initialize>: Creating G4 hierarchy ...
Info in <TGeoManager::ConvertReflections>: Converting reflections in: FAIRGeom - FAIR
geometry ...
Info in <TGeoManager::ConvertReflections>: Done
===> GEANT4 materials created and mapped to TGeo ones...

-------- EEEE ------- G4Exception-START -------- EEEE -------
*** G4Exception : G4Root_F003
      issued by : TG4RootDetectorConstruction::CreateG4LogicalVolume
      Cannot make material for volume: BarrelDIRC

*** Fatal Exception *** core dump ***
-------- EEEE -------- G4Exception-END --------- EEEE -------


*** G4Exception: Aborting execution ***
spataro@briareos:~/jan12/pandaroot/macro/drc$
```

In order to see this I have run macro/drc/sim_dirc.C. If I use G3 I have no crash. This affects all the macros using G4. Could somebody please check what is going wrong?
I am using jan12 and latest trunk.

Subject: Re: Crash in DIRC with G4
Posted by StefanoSpataro on Thu, 19 Jan 2012 10:36:35 GMT
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Hi,

just a small addendum.
Dirc works wth the option "geomRootToGeant4" in g4Config.C, but in such a case STT and MVD geoemtries are not working anymore.

Is there a way to have all these detectors working under geant4 at the same time?

Subject: Re: Crash in DIRC with G4
Posted by Tobias Stockmanns on Thu, 19 Jan 2012 10:45:02 GMT
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Hi,
the MVD cannot run with a native Geant4 geometry because it uses assemblies which are not supported in Geant4.

Cheers,

Tobias

Subject: Re: Crash in DIRC with G4
Posted by Ivana Hrivnacova on Tue, 13 Mar 2012 09:54:36 GMT
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Dear all,

There is no problem with assemblies for converting geometry from Root in Geant4. They are fully supported in the VGM converter.
Also, the crash when using geomRoot option in some detectors is not normal.
Could you, please, send me a geometry files with these geometries (one with the detector having a problem with geomRootToGeant4 and another one with those crashing with geomRoot) so that I can investigate it outside the PandaRoot framework?

Thank you,

Ivana

Subject: Re: Crash in DIRC with G4
Posted by StefanoSpataro on Tue, 13 Mar 2012 14:31:59 GMT
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Dear Ivana,
if you like to play with our geometry files ,
this is the one working with geomRootToGeant4, and this is the other whch is working with geomRoot.

Good luck!

Subject: Re: Crash in DIRC with G4
Posted by Ivana Hrivnacova on Tue, 13 Mar 2012 15:17:14 GMT
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I am getting error when trying to open these files in root:
root [0] TGeoManager::Import("dirc_l0_p0.root")
Info in <TGeoManager::Import>: Reading geometry from file: dirc_l0_p0.root
(class TGeoManager*)0x0

Maybe there has to be first loaded some top file?

Thanks,

Subject: Re: Crash in DIRC with G4
Posted by Maria Patsyuk on Wed, 14 Mar 2012 01:41:24 GMT
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Hello,

I'm the responsible person for the DIRC simulation in PandaRoot, but now I'm away. If it is possible to wait a week until I'm back at GSI, I'll take a look into all these bugs. I'm following this thread, but unfortunately right now I can't do anything.

Best regards,
Maria

Subject: Re: Crash in DIRC with G4
Posted by Ivana Hrivnacova on Wed, 14 Mar 2012 11:34:11 GMT
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Dear Marina,

I need just a geometry file which I can open outside pandaroot framework, so maybe Stefano or someone else can re-generate a complete Root file in meantime.
But it can wait when you are back as well.

Best regards,

Ivana

Subject: Re: Crash in DIRC with G4
Posted by StefanoSpataro on Wed, 14 Mar 2012 17:10:33 GMT
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I attach here the root file where I have exported the TGeoManager of our DIRC, I don't know if you are able to read it from the forum.

The macro to create it is the following, but it has inside panda dependencies.

File Attachments

1) test.root, downloaded 436 times

Subject: Re: Crash in DIRC with G4
Posted by Ivana Hrivnacova on Thu, 15 Mar 2012 13:00:51 GMT
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The file is ok; I was able to reproduce the crash with G4Root (used in geomRoot) option. I will report the problem to Andrei Gheata who developed this tool.

Could you also re-generate Root files with the other geometries failing with geomRootToGeant4?

Thank you,

Ivana

Subject: Re: Crash in DIRC with G4
Posted by StefanoSpataro on Thu, 15 Mar 2012 13:52:41 GMT
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It seems with geomRootToGeant4 we have many strange warnigns not appearing in the gemRoot case:

```
-I- Initializing PndSdsDetector()
++++  TG4Warning:  ++++
   TG4SDServices::GetVolumeID:
   Unknown Volume Id for PixelActiveo5oPartAss
++++++++++++++++++++++

++++  TG4Warning:  ++++
   TG4SDServices::GetVolumeID:
   Unknown Volume Id for PixelActiveo5oPartAss
++++++++++++++++++++++



++++  TG4Warning:  ++++
   TG4SDServices::GetVolumeID:
   Unknown Volume Id for SciTiloPartAss
++++++++++++++++++++++
```

During event loop:

++++ TG4Warning: ++++
TG4MCGeometry::GetTransformation:
Daughter volume &stt01assembly in /cave_1/&stt01assembly_0%stt01tube_57/stt01gas_1 does not exist.
++++++++++++++++++++++

and

Negative element index in EMC, name=cave

...
maybe detector experts should comment about, I don't have the macros to produce such geometries with TGeoManager (it is more than one detector, as you can see).

Subject: Re: Crash in DIRC with G4
Posted by asanchez on Thu, 15 Mar 2012 14:16:00 GMT
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yes,
from my experience that is due to the fact that when one uses the option GeomRootToGeant4 the path to the sensitive volume
within the volume hierarchy is not separated by "/" but "&" .....

best regards
Alicia.

Subject: Re: Crash in DIRC with G4
Posted by Oliver Merle on Wed, 28 Mar 2012 12:04:39 GMT
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I've observed the same problem when I started implementing the Disc DIRC geometry earlier this year. To understand how you construct the geometry within PandaRoot, I had to read your code (thanks for the missing documentation, really helpfull) and expected undefined behavior if the first volume (v1 in void FairModule::ConstructRootGeometry()) is not a TGeoAssembly.

The reason is simple: the material of the first volume is ignored. Hard to believe that these geometry files have ever worked in Geant4 - how was it possible without proper material information? Somehow I doubt that they worked ever. With which version of pandaroot and external packages did they actually work? I would like to check that.

I've implemented a fix which works fine for me. Try the attached version FairModule and see if it solves your problem.

Regards,
Oliver

File Attachments
1) FairModule.tar.gz, downloaded 416 times

Subject: Re: Crash in DIRC with G4
Posted by Mohammad Al-Turany on Wed, 28 Mar 2012 14:40:48 GMT
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Hallo Oliver,

The ConstructRootGeometry was specially implemented for ROOT files which are produced by the CAD2ROOT converter where the keeping volumes are always "Assemblies" and maybe that is the reason we did not see any see the crash there, in any case if you discover an error there then thanks a lot we will check that and correct it and write in the credits that you discover it!

now if you read the posts before yours, you will notice that the crash was reproducible without FairModule and without the error you discover.

Quote:The reason is simple: the material of the first volume is ignored. Hard to believe that these geometry files have ever worked in Geant4 - how was it possible without proper material information? Somehow I doubt that they worked ever. With which version of pandaroot and external packages did they actually work? I would like to check that.

This is very easy to test, in the g4Config.C set the option: geomRootToGeant4
This works with the same DIRC geometry and the (according to your comments) crappy code in FairModule, for your info, this option means use the native G4 geometry and navigation, and this works with all versions of PandaRoot and external packages, the problem when you set this option is that some detectors (STT and emc) relay on the herachy of volumes to create set some variables, in ROOT the Assembly has an ID and can be a mother of a volume, in G4 the assemblies do not show up at all during the simulation, and this create some problems (Stefano mentioned this in the second post here!)

About the documentation I cannot promise to document every single line in the code, but we will try our best!

regards

Mohammad

Subject: Re: Crash in DIRC with G4
Posted by Oliver Merle on Wed, 28 Mar 2012 16:39:01 GMT

Thanks Mohammad,

Mohammad Al-Turany wrote on Wed, 28 March 2012 16:40
This is very easy to test, in the g4Config.C set the option: geomRootToGeant4
This works with the same DIRC geometry and the (according to your comments) crappy code in FairModule,

I thought I had tested this with native navigation, but it seems I switched to G4 after the update of FairModule. Silly me. Anyhow, even if it doesn't crash with G4 native navigation, the material of v1 is not guaranteed to be equal to the one defined in the media file because it was not obtained via your factory.

The "crappy" code works, it just has to be called for v1, too. Fixing this is no big deal, so I don't care about any credit. I guess it wouldn't hurt to use the Logger instead of std::out, too. (BTW: I was a bit pissed when I fixed the issue)

Quote:
About the documentation I cannot promise to document every single line in the code, but we will try our best!

It is NOT about commenting a line of code. I can read C++. It is about commenting how the algorithms are intended to work, why things are implemented that way and how things are intended to be used.

Regards,
Oliver

Subject: Re: Crash in DIRC with G4
Posted by Mohammad Al-Turany on Wed, 28 Mar 2012 18:46:27 GMT

Hallo Oliver,

Ok, I added your changes to SVN (r 15136) I also get rid of COUTs and add a few lines explaining some functionality, but still many things to document!

regards

Mohammad
