Basic & Extended Examples Parallel Session Summary

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18th Geant4 Collaboration Meeting,
23 - 27 September 2013, Seville

Agenda

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Testing graphics in Geant4 tests (test202)	*Laurent GARNIER*
Seville, Spain	14:30 - 14:45
Tools for calculations in microdosimetry and radiobiology	*Miguel Antonio CORTES GIRALDO*
Seville, Spain	14:45 - 15:00
Examples with Macros and Other Resources	*Dr. Benjamin MORGAN*
Seville, Spain	15:00 - 15:10
Status of the planned developments: coding guidelines, MT migration, g4tools migration, code review	*Dr. Ivana HRIVNACOVA et al.*
Seville, Spain	15:10 - 15:40
Disussion	
Seville, Spain	15:40 - 16:00

Testing Graphics in Geant4 Tests

- By Laurent Garnier

- Report on test202

- Running visualization in a frame buffer instead of inside a window, thanks to XVFB library

- The test is included in standard cdash tests

- Still to do: compare generated pictures against a reference file folder

  - Current test detects only warnings and exceptions from visualization

- This can be used also in a user application to produce a visualization output in a batch mode

Tools for calculations in microdosimetry and radiobiology

- By Miguel Antonio Cortes-Giraldo
- Two "mini-examples" MicroCavity and Radial Dose Calculation from medical domain were presented

- MicroCavity: Accounting lineal energy (energy deposited over mean chord length), frequency mean (yF) and dose mean (yD) lineal energy

- Radial Dose Calculation (Track Structure)
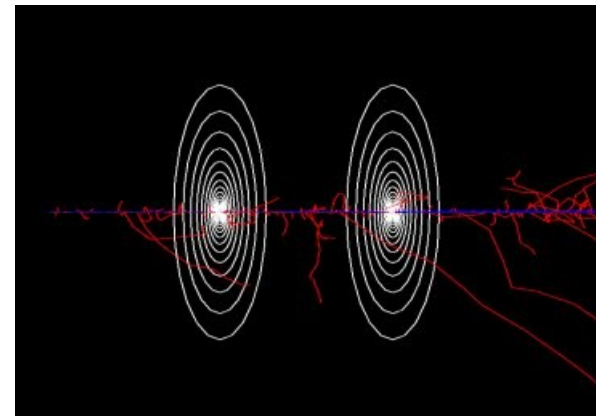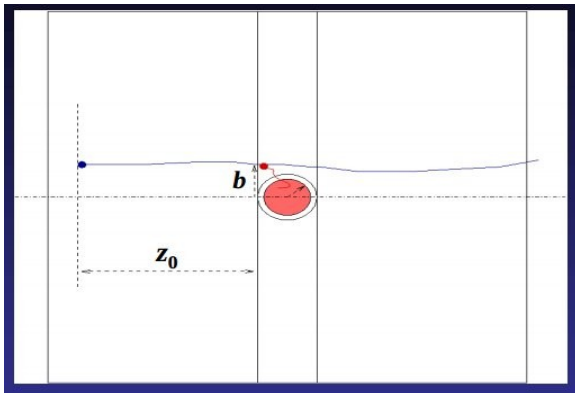
Tools for calculations in microdosimetry and radiobiology (2)

- Plus Other General Tools:
- Extended Primary Generator Class:
  - Includes capabilities such as creating primaries from histograms (either ASCII or ROOT format) and from IAEAphsp* files
- Primary Vertex Verifier
  - Collect physical quantities of primary particles and fills their distributions in histograms
  - The goal is to help the user to discover potential bugs within his/her concrete Primary Generator Action class.
- To be further discussed and finalized with advanced examples WG and Sebastian Incerti (low energy EM)

Examples with Macros and Other Resources

- By Ben Morgan
- Problem 1: Hard Coded Script Paths
  - Cannot run application unless scripts are in CWD
- Problem 2: Locating Physics Data Resources
  - N further environment variables to set
  - Geant4/Data Resource versions must be compatible

- Users/Developers need flexibility

Examples with Macros and Other Resources (2)

- Possible solution:
  - Access data resource via "G4GetResource(name)"
  - Locates resource via Environment, then a path list
  - The list can initially hold a runtime/hardcoded path
- Discuss further the requirements and propose a solution
  - Probably not for 10.00

Examples planned developments & issues

- Migration to MT:
  - Uniform way of setting the number of threads In all basic examples and in extended where appropriate:
    - Remove runManager->SetNumberOfThreads(N)
    - Use the G4MTRunManager default number of threads, which should be (and it is) = 2
    - Make possible to set this information also via environment variable
  - Discussion about redirecting thread outputs in files by default
    - However this is wanted in examples but not in tests, to find a solution with MT team
  - Migrate one of hadronic examples

Examples planned developments & issues (2)

- Continue with coding guidelines effort

  - Remains to verify the guideline 2.4. about demonstration of all implemented commands in macros

  - Remind the developers of 5 remaining examples not yet processed

- Examples Reviews:

  - Continue in 2014

  - Agreement to make the review process more formal and require the examples developers to provide a written response to the review

Examples planned developments & issues (3)

- Obsolete features which are present in a large number of examples:
  - Re-implemented commands already available in kernel:
    - /exampleXY/vis/drawTracks, /exampleXY/setCut
  - Explicit use of std:cout, std::cerr, exit()
  - The list of such features will be maintained on wiki page
    - This will make the developers easier to check them in their example(s) and also to extend this list if someone finds another old fashioned code

Examples planned developments & issues (4)

- extended/analysis/A01 example -> basic/B5
  - The example was added to demonstrate the AIDA analysis which is now being replaced with g4tools, use of which is already demonstrated in AnaEx01
  - This example demonstrates various aspects of Geant4 application in still quite easy level and it is one of rare examples with non trivial geometry, accounting hits of both tracker and calorimeter type and its scenario is used in tutorials

- Move creating of G4UIExecutive at the beginning of main() ?
  - It would allow handling warnings/exceptions issued from detector construction and physics lists by UIExecutive
  - But it would shift creating run manager (and selection of MT mode) further