



ATLAS G4 Simulation Update

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G4 Tech Forum

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Platforms and Versions

- We build against CLHEP 1.9.3.1 and slc4-gcc346 (aka gcc34) in 32- and 64-bit modes
 - 32-bit is validated currently, 64-bit in the future
- Currently G4.8.3patch02 with additional modifications to geometry (BREPs+G4Tubs)
 - *This will be used for first data*
 - Plan to move to G4.9.X in late fall
 - Should we be testing the G4.9.2 beta as a serious candidate? Or will it be all G4.9.1 this year?
 - Are there patches (other than the G4Tubs patch) that we should wait for?



Bug Reports (Closed)

- Two major problems fixed in the last few months!
- Problem with the fix of G4Tubs
 - `distanceToIn=distanceToOut=0`
 - Caused stuck tracks in 1% of events
 - Fixed in private patch, seems to be working
- Problem with particles beginning out of world
 - Generator was decaying a particle outside of the world volume
 - Seg fault in G4VoxelNavigation
 - Fixed on our end - should probably be patched in G4
- G4Exception from hadronic processes
 - Reported as a G4Exception, then prints “Just a Warning”



Bug Reports (Open)

- Error in log file repeated several 100k times (causes eventual crash)
 - WARNING - G4PropagatorInField::ComputeStep():
Zero progress for 51 attempted steps.
 - Being explored by Tatiana (thanks!)
- G4Propagator (reported to John Apostolakis)
 - Not a clue what's causing this one yet
 - *** G4Exception : FatalError
issued by : G4PropagatorInField::LocateIntersectionPoint()
Error in advancing propagation.
*** Fatal Exception *** core dump ***



Performance Issues

- Interesting stepper feature found by Makoto Asai: Charged geantinos take longer to simulate than do muons without secondaries
 - Likely culprit is too-long steps with too-tight accuracy parameters that must be broken up by the stepper
 - Makes comparisons a bit harder
 - Step limitation might solve this problem
- Since our move to QGSP_BERT, *optimization*
 - Now using a neutron time cut
 - Searching for additional possibilities, particularly in optimization of steppers



Performance Requests

- Makoto Asai has also been helping with stepper optimization via a Stepper Dispatcher
 - Selects the optimal stepper based on particle type, material, energy, region, etc
 - Causes a loop dependency in G4
 - Still, probably *should* be a part of Geant4
 - I leave it to you guys to figure out how :-)
- It would be very nice to have an enumeration of processes
 - Current string comparison is nasty