



# ALICE Requirements

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# Geant4

## Current Usage and Activities

- Special Productions on request
  - Geant4 v10.01, Geant4 VMC v3.1
  - Pythia MinBias + Light-(anti)nuclei (d, t, He3,  $\alpha$ )
- Multi-Threading Tests
  - Geant4 v10, Geant4 VMC v3.1 (MT)
  - Test suite based on Geant4 VMC example A01
    - Full AliRoot geometry
    - Realistic field and generator
    - TPC Hits
  - Perform Scaling Tests
- Computing time optimization
  - Geant4 v10.01, Geant4 VMC v3.1
  - Several optimization steps
    - TGeo, Interface, stepper, field caching, cuts, ...
    - Overall factor 1.8 gain
    - G4/G3 ~ 1.6
    - Investigating static libraries now

# Requirement

- The Fatal exception from `G4MultiLevelLocator::EstimateIntersectionPoint()` happens “frequently” in GRID productions
  - Aborting run invalidates all previously simulated events
- Reported to Geant4 geometry group at end of January
  - Under investigation
- Request to change the Fatal exception in Warning if the problem cannot be fixed in a time scale of few weeks

# Issue (cont.)

----- EEEE ----- G4Exception-START ----- EEEE -----

\*\*\* G4Exception : GeomNav0003

issued by : G4MultiLevelLocator::EstimateIntersectionPoint()

Error in advancing propagation.

Point A (start) is ( X= -44.9203 -18.0893 -5827.97 P= 0.0369421 -0.857783 0.376371  
Pmag= 0.93745 Ekin= 0.556677 m0= 0.510999 Pdir= 1 l= 23.7875 t\_lab= 0 t\_proper= 0 )

Point B (end) is ( X= -44.9203 -18.0893 -5827.97 P= 0.0369421 -0.857783  
0.376371 Pmag= 0.93745 Ekin= 0.556677 m0= 0.510999 Pdir= 1 l= 23.7875 t\_lab= 0  
t\_proper= 0 )

Curve distance is -1.08096e-07

....

# Issue

The final curve point is not further along than the original!

Point A (Curve start) is ( X= -46.0768 -13.9252 -5829.99 P= 0.40513 -0.73881  
0.410904 Pmag= 0.93745 Ekin= 0.556677 m0= 0.510999 Pdir= 1 l= 18.9823 t\_lab= 0  
t\_proper= 0 )

Point B (Curve end) is ( X= -44.9203 -18.0893 -5827.97 P= 0.0369421 -0.857783  
0.376371 Pmag= 0.93745 Ekin= 0.556677 m0= 0.510999 Pdir= 1 l= 23.7875 t\_lab= 0  
t\_proper= 0 )

Point A (Current start) is ( X= -44.9203 -18.0893 -5827.97 P= 0.0369421 -0.857783  
0.376371 Pmag= 0.93745 Ekin= 0.556677 m0= 0.510999 Pdir= 1 l= 23.7875 t\_lab= 0  
t\_proper= 0 )

...

LocateIntersection parameters are : Substep no= 6

Substep depth no= 0 Depth=0

\*\*\* Fatal Exception \*\*\* core dump \*\*\*

----- EEEE ----- G4Exception-END ----- EEEE -----

\*\*\* G4Exception: Aborting execution \*\*\*