

ATLAS computer performance: a brief update

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Simulation Team

(Report & context: J. Apostolakis)

Geometry improvements

- Adoption of G4 Solids improvements in G4Box, G4Trap
- Improvement of description of a few volumes in ATLAS setup (large envelopes – unions, complex polycones)
- Details in Evgueni's talk (Geometry – Parallel 4B, Tuesday 16:00-17:30)

Effect of G4Solid patches on ATLAS Computing Performance

Patch	G4 10.1.patch03.atlas02 (MC16 Production version)	G4 10.1.patch03.atlas07 (latest G4Solid patches)
Standard Simulation <CPU/event> (relative)	1.0	0.97
G4Exception instances during standard simulation of 500 events	63 - Track stuck or not moving. 8 - Proposed step is zero; hstep = 0 ! 1 - Expected normal-global-frame to be valid	None
Fast Simulation (ATLFASTII) <CPU/event> (relative)	1.0	0.95

Other
improvements

Other performance improvements in the works for ATLAS Simulation

- **Andrea Dotti provided us with a plan for how to combine all ATLAS code with a G4 dependency into a single library which we will statically link to Geant4.**
 - Requires CMake 3.12, which we now have available in our nightlies.
 - Ben Morgan et al. will follow up.
- **Ben Morgan is looking into building Athena on top of G4 10.5.beta with vecGeom.**
- **Have started looking into profile guided optimization.**
- **After this will look into biasing options for further speed-ups.**