

# ATLAS Software Status and Plans

## ➤ ATLAS Simulation Validation towards DC3

### ➤ multilevel

#### ➤ *In the simulation core group*

- For the overall behavior monitoring
  - No-crash tests
  - Performance monitoring and comparisons with previous releases
- Addressed in the nightly tests

#### ➤ *In the detectors*

##### ➤ *For geometry tests*

- No-clash tests
- Incremental tests on geometry
- Precise geometry tests (edge regions, cracks)

##### ➤ *For the hit & digits correct association*

- No displacements, correct clustering, refined digitization algorithms

#### ➤ *In the productions (physics validation group)*

##### ➤ *For physics checks*

- To verify performances (after cuts optimization) and comparisons with data or previous versions



# ATLAS Software Status and Plans

- Release 11.0.4 built last week BUT
  - A bug was recently discovered in the Calorimeter clustering in release 11.0.4 that affects e/gamma reconstruction As a consequence electrons and photons in the eta region [-1.5, 0] are not reconstructed
    - build release 11.0.41
- Release 11.0.5 open for HLT & CTB
  - An 11.0.5 will be built to fix this small problem and to accommodate changes in the HLT.
- Generation and simulation done with 11.0.4 can be reconstructed with 11.0.5 once 11.0.5 is validated
  - Generation and simulation with this release will continue until 12.0.x is validated
  - **NO generation or simulation (CSC samplesA) will run with 11.0.5**
- Release 11.2.0 built primarily for commissioning
  - But has needed geometry "tree-nodes" in place
- Release 11.3.0 opened as project builds only
  - <https://uimon.cern.ch/twiki/bin/view/Atlas/WorkingWithProjectBuilds>
  - Delayed until 14 Feb
  - Is likely to be unstable because of ROOT5 migration
  - But this migration is a necessary prerequisite for release 12
- Release 11.4.0 inserted on 7 Mar
- **SoftwareValidation**
  - Release 11 (CSC) Model
    - Use production cycles to simulate (reconstruct) 100K events
    - Sample A, defined by the comb. performance groups
      - [https://uimon.cern.ch/twiki/bin/view/Atlas/ValidationSample#Validation\\_Sample\\_Sample\\_A](https://uimon.cern.ch/twiki/bin/view/Atlas/ValidationSample#Validation_Sample_Sample_A)
    - Various problems (technical and not) fixed along the way
    - Duty cycle of about 2-3 weeks (depend on grids)
    - Efficient during the release 11 cycle



- Repeat release 11 cycle experience
  - Sometimes improve communication with comb. perf. groups.
  - Start earlier. 11.3.0 to be used for sample-A to spot technical issues
  - Higher priority than CSC1 production
- Release 11.3.0/11.4.0/.... Put in most of the latest developments:
  - What is the present status of the geometry?? ATLAS-DC3-03
  - Misalignments??
  - MC truth following task force recommendation??
  - Anything new in Simulation??
- Geant4 version:
  - Use `geant4.7.1.p01.clhep1.9.2.1` as a default
  - Use Geant4 v8 for validation purposes. (separate build)
  - Large update of geometry. Change one thing at a time!



## Release 12

- Scheduled for 28 March
  - Just delayed from 28 Feb
- **Primary goals**
  - Complete implementation of as-built geometry for all detectors
  - Conditions DB infrastructure in place and significant usage of COOL
    - Includes new COOL functionality (requires ROOT5)
  - Trigger AOD EDM in place
  - Implementation of MC Truth Task Force Recommendations
  - Implementation of Event Tag Working Group Recommendations
  - New Tracking validated and performance equal or better than alternatives
  - Gcc 3.4.4 32-bit mode
    - Needs LCG\_41 which is in root5 migration



## Validation status after 11.0.4 and 11.2.0

### - *In core*

- Fast for no crash tests and performance monitoring
- Slower if with RTT
  - Startup phase still -> see tomorrow's talk @ detector sim phone meeting

### - *In detectors*

- Fast for geometry tests and no-clash tests
  - not well optimized procedure and timing for a whole program of mandatory tests when a release is available, still incomplete RTT tests
  - Physics validation in test beam comparisons slow (reconstruction)

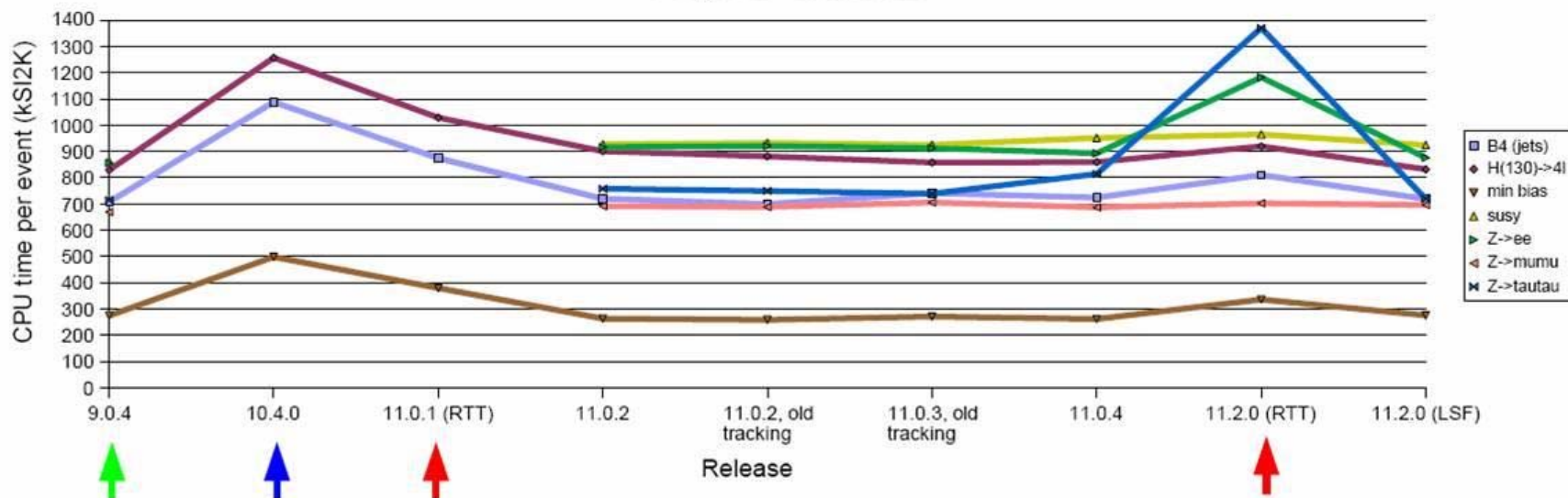
### - *In physics validation*

- **Overall roles not well defined**
- DD group to be strengthened and organized



# CPU time measurements (2)

Physics channels

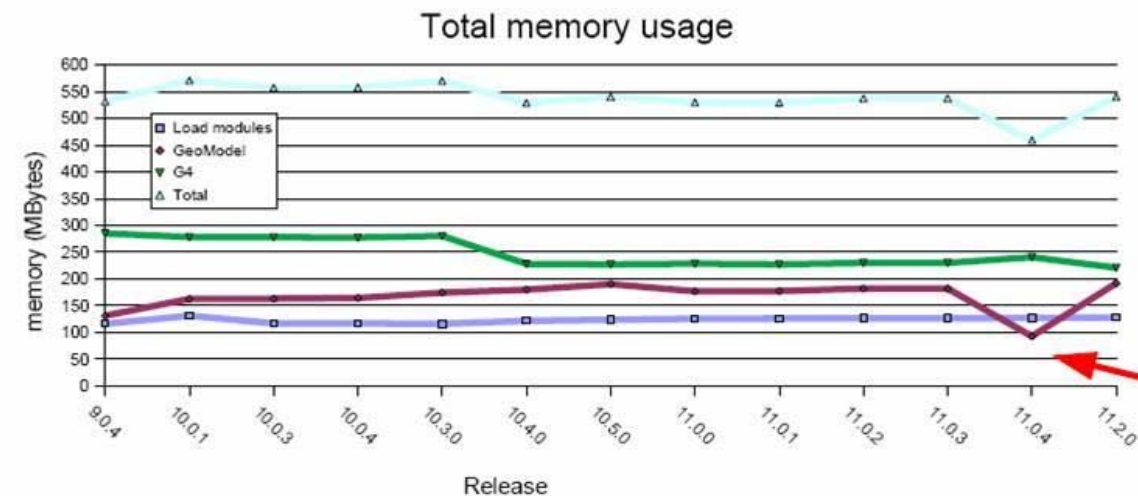
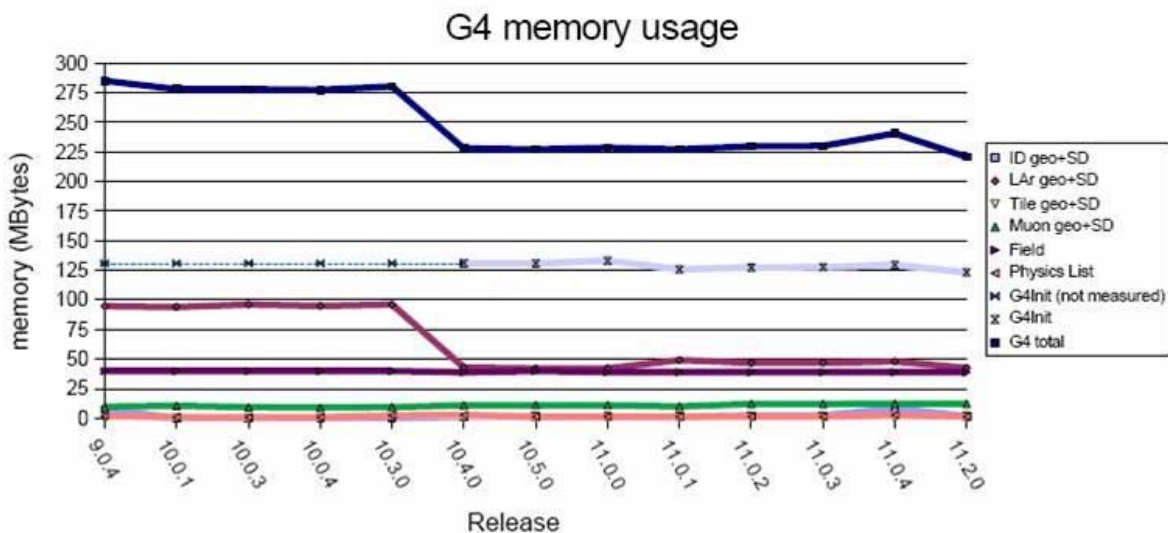


- Timing performance for physics channels has remained constant since **9.0.4**
- Tests on **10.4.0** are not reliable due to frequent job crashes (not yet understood)
- There seem to be some problems in converting **RTT** time results to kSI2K (more details later in the talk)





# Memory usage at run time



Memory usage at run time is well under control.

A significant amount of memory is still needed in the main branch for the connection to the geometry DB. Release **11.0.4** proved that a switch to SQLite instead of ORACLE allows to gain ~90MBytes of memory.

**use of SQLite instead of ORACLE for geometry db**



## Geant 4 versions

Release	Release date	G4 release
9.0.4	01/29/05	geant4.6.2.p01.clhep1.8.2.1
10.0.1	03/24/05	geant4.7.0.clhep1.8.2.1-atlas
10.0.4	05/27/05	geant4.7.0.clhep1.8.2.1-atlas
10.3.0	06/17/05	geant4.7.0.p01.clhep1.8.2.1-atlas
10.4.0	08/13/05	geant4.7.1.clhep1.9.2.1
10.5.0	09/09/05	geant4.7.1.clhep1.9.2.1
11.0.0	10/21/05	geant4.7.1.clhep1.9.2.1
11.0.1	11/11/05	geant4.7.1.p01.clhep1.9.2.1
11.0.2	11/25/05	geant4.7.1.p01.clhep1.9.2.1
11.0.3	12/16/05	geant4.7.1.p01.clhep1.9.2.1

G4 vs.8: Rebuilding of 11.0.4 with tag External/Geant4-00-03-27 in progress

Detailed validation and comparisons still pending (MS)





# MuonSpectrometer Goals for Rel 12.0.0

- **Deliverables for DC3:**
  - Goal: Muon spectrometer “as built” (more realistic...)
  - Muon Detector description: parameters from AMDB (activ & Dead)
- **Version R : Symmetric description (more or less validated)**
  - *MuonSpectrometer-R-01-01.Initial : muon tag in Oracle DB*
  - Barrel clash free for activ/activ part
  - EndCap test in progress
    - All clashes are identified and the majority is fixed (barrel)
  - S. Baranov, N. Benekos, T. Moore, D. Rebuzzi, M.Schott
  - Fully tested in G4
  - **Ready to migrate it at 11.3.0 and 11.0.5**
- **Version R' : egg shape description (7mm maximum for sector5)**
  - *MuonSpectrometer-R-01-01-initial\_EGG: muon tag in Oracle DB*
    - R' (should not be a problem)
- **Version R'' : egg shape + chambers shifted (~1mm) & tilted(~1mrd) randomly**
  - *MuonSpectrometer-R-01-01-initial\_EGG\_RNDM : muon tag in Oracle DB*
  - R'' problems expected due to the misalignement input
- **Work in progress to test at Geometry & Simulation level R' and R''**
  - **R already in the pipe(11.3.0-11.0.5)**
  - **R' should be tested & validated before end of Feb (11.4.0)**
  - **R'' should be tested & validated before end of March (12.0.0)**
  - Preliminary study of misalignment effects (see Mathhias' talk)
- **Envelope changes**
  - Muon System envelope was resized recently in order to contain all its daughter volumes and also to fit into Cavern description
  - The work started for placing shields in a separate envelope
  - This will lead to new dimensions of the Muon System volume

