

The H6 Testbeam Simulation in the Atlas Framework

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Motivation

- Testbeam Simulation has so far been run stand-alone, with different processing compared to ATLAS simulation.
- Full underway now: implementation of the same simulation environment for testbeam as for Atlas. Only then will we be able to reliably translate what we learned from the testbeam to the full Atlas simulation.
- This means: For the first time ever, we have the Atlas simulation as well as the H8 and H6 testbeam simulations under the same roof!

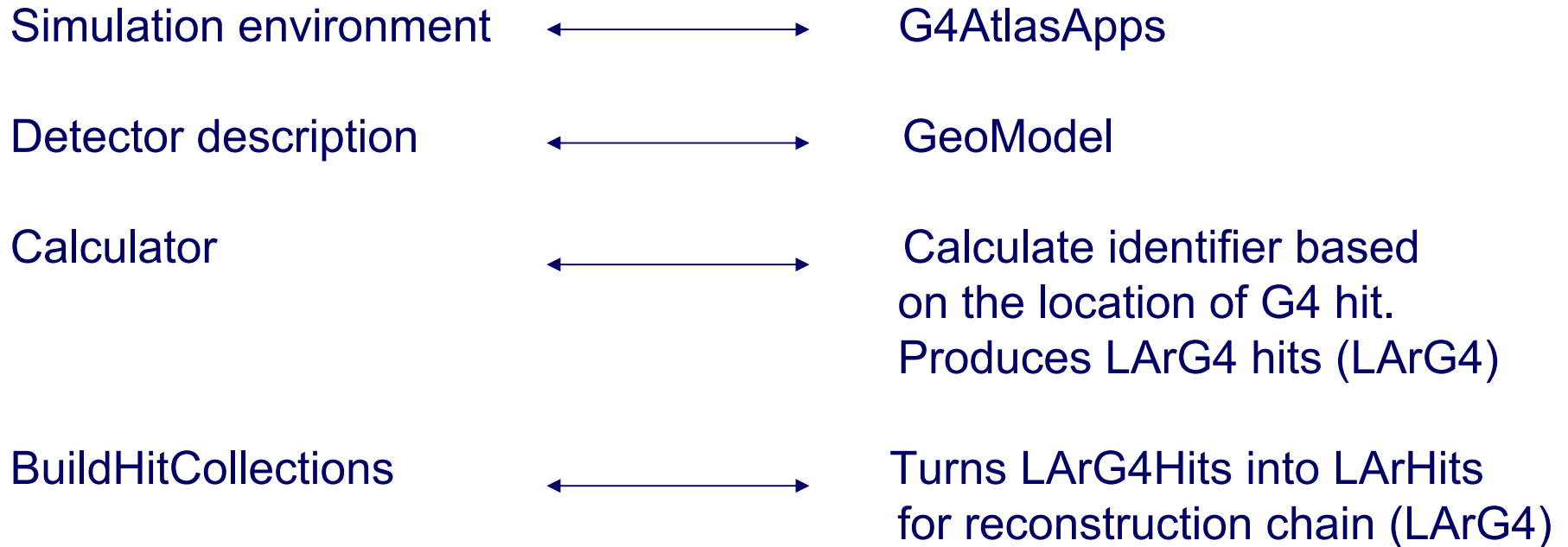
What has been done so far

(overall coordination: Joe Boudreau)

- Nov 2005 --- workshop in Ottawa:
2003 FCAL GeoModel Description + sensitive detector(SD)
(still in LArG4TB environment)
- Dec 2005 --- workshop in Marseille (2002 EMEC standalone description)
- Dec/Jan --- 2002 HEC TB GeoModel description + SD
H6 Cryostat GeoModel description
- Feb 2006 --- workshop at CERN:
Add EMEC to 2002 EMEC/HEC TB setup
implement first version of Local calculator
make Cryostat and Table “moveable” via jobOpts.
implement all into G4AtlasApps
- Ongoing --- debugging and improving Calculators/Geometry

Ingredients

(at the moment)



Main Control

The general control for the simulation is located in the G4AtlasApps package. G4AtlasApps provides a python-controlled interface to Geant4. For details see:

<http://atlas-computing.web.cern.ch/atlas-computing/packages/simulation/geant4/G4AtlasApps/doc/index.html>

Python scripts and jobOptions allow the steering and selection of individual testbeam layouts.

H6 layouts present at the moment:

- 2002 EMEC (Marseille group)
- 2002 EMEC/HEC (Margret Fincke, Pavol Strizenec, Valentin Niess)
- 2003 FCAL (Mohsen Khakzad, JP Archambault)

Under the overall tutelage of Joe Boudreau and big help from Manuel Gallas

The H6 Simulation Parts

Simulation/G4Atlas/G4AtlasApps

share: jobOptionG4TB_LArH6(XX).py

(select setup via SimFlags:
Layout, particle, energy, #events,
verbosity of output)

python: tbLArH6_calor.py

(set sensitive detectors, physics cuts)

tbLArH6_flags.py

(define H6 TB simulation flags)

Visualization

(Joe Boudreau)

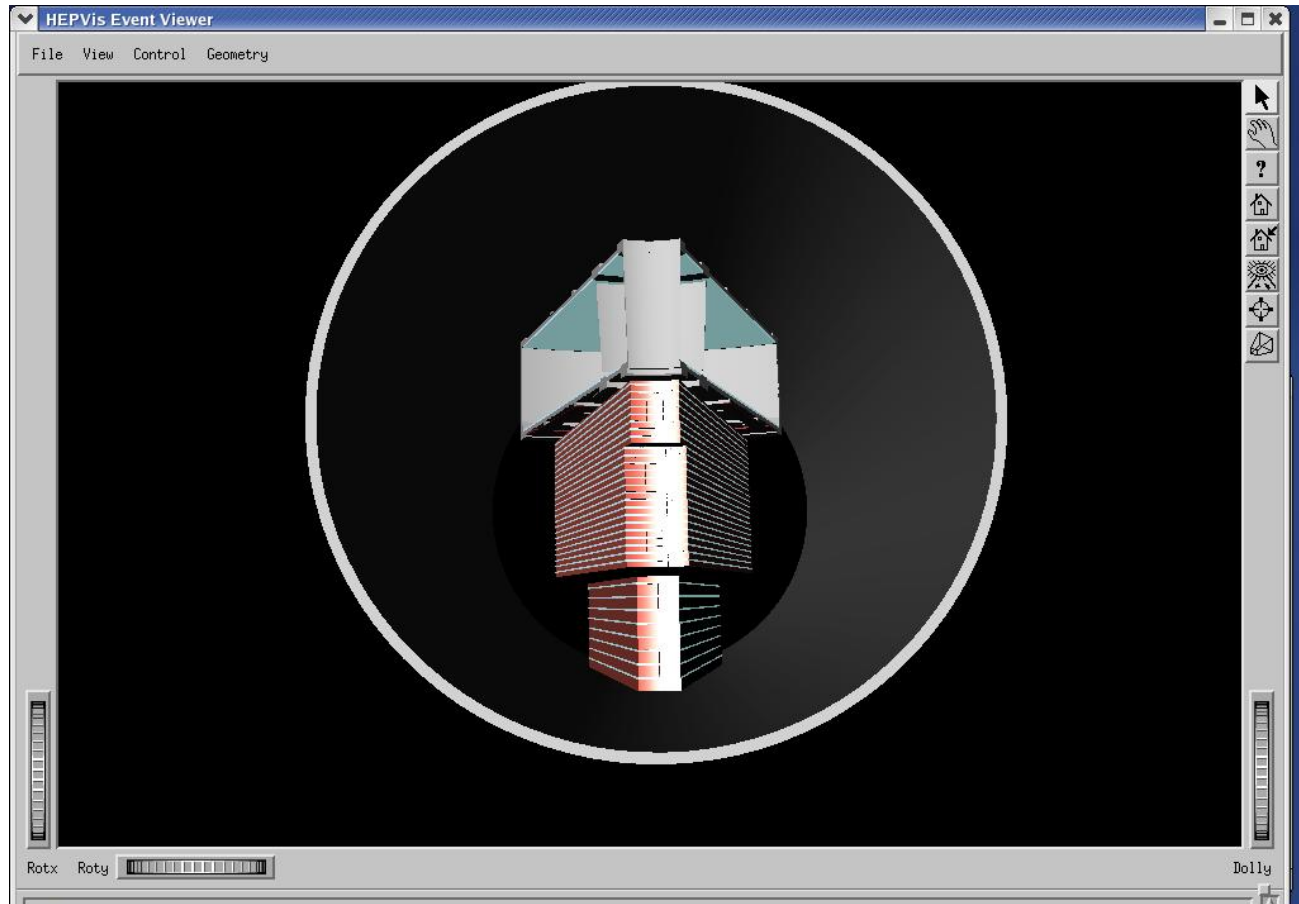
In AtlasGeometryCommon/GeoModelDisplay : v-atlas

Allows the user to see the details geometry.

For instructions see:

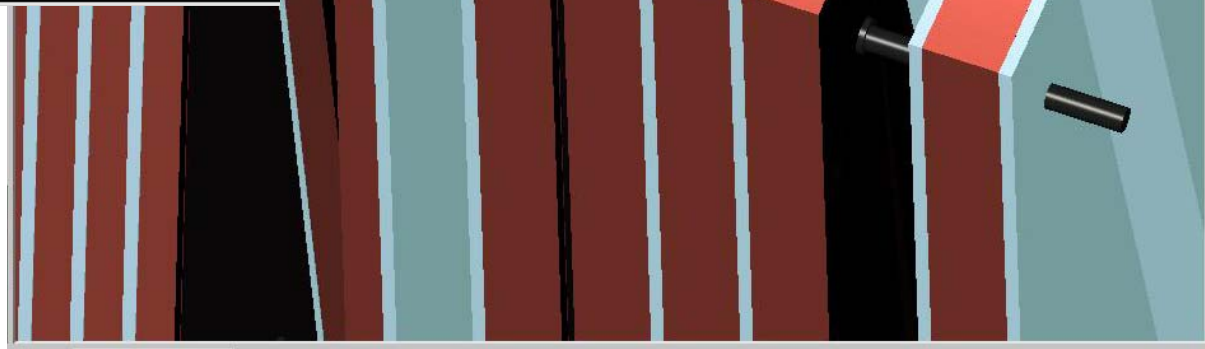
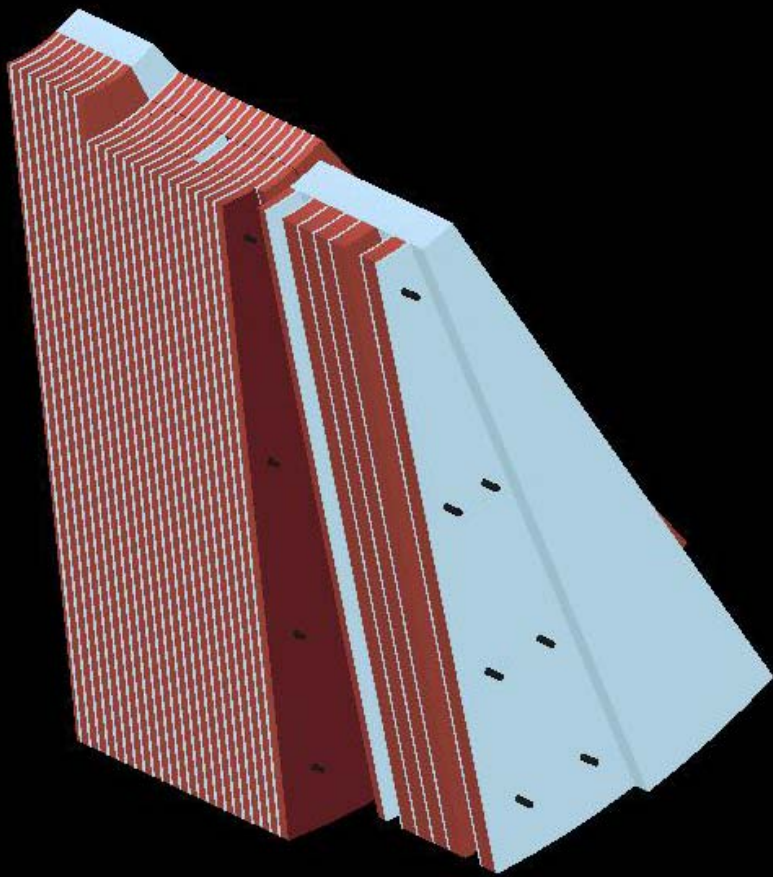
<http://boudreau.home.cern.ch/boudreau/v-atlas-hepvis.htm>

2002 EMEC/HEC testbeam layout



2002 TB HEC module
in v-Atlas...

... close-up



Present Status

Merging the H6 TB into the Atlas framework leads to some debugging
Of the code:

Original Atlas calculator determines the location of
G4 hits from global coordinates.

⇒ Calculator not flexible enough to accommodate positioning
of detectors in any other than the ideal location.
Some details of the code become difficult to follow

A move to local module coordinates makes the code more
transparent and allow the use of the same calculator for Atlas
and testbeam.

Status ct'd

Original Atlas calculator is pointing in η .

TB HEC calculator takes the boxy-ness of the HEC cells into account.

Aim is to adapt the “boxy” calculator for full Atlas.

→ This has just (as of Apr.20) been completed in local coordinates
by Pavol

Remove hard-coded numbers from the code wherever possible.

⇒ Will allow switching between different geometry versions

Outlook

Debug/improve calculators ($\sqrt{}$) and geometry description

Generate events and compare with data

Add beamline instrumentation

Add 2004 EMEC/HEC/FCAL Layout

Make combined TB setup calibration sensitive

}
June
LArg week

}
December
LArg week