

Software and Combined Testbeam Summary

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TRT Workshop at Peñíscola

Talks Given

- Talks on Tuesday:
 - Barrel TR performance studies at 20 GeV (Vladimir)
 - Barrel TR performance studies at low energies (Serge Sm)
 - Studies of alignment and calibration for testbeam (Peter)
 - Studies of alignment with Athena (Peter)
 - News about TRT-related work on offline software (FL)
 - Status and Plans of TRT GEANT4 work (Andrei & Yura)
 - Work on TR Simulation in GEANT4 (Mogens)
- Discussions about the combined testbeam software were held on Monday, Tuesday, and Thursday.
 - Most of this talk will be about the combined testbeam discussion

Barrel Module TR Performance

- Vladimir and Serge Sm. analyzed the 1-20 GeV data and found this performance:
 - Reasonable low level hit efficiencies for both e and π .
 - Eff = ~96%
 - Reasonable high level hit efficiencies for both e and π .
 - Eff = ~6% for π and ~23% for e with a 7 keV threshold.
 - Expected turn on effect for the electron hit probability was observed.
 - Barrel modules generate somewhat less TR than the end-cap (also expected)
 - Straw to straw high threshold hit efficiency variation occurs (caused by threshold variations?)
- Overall the TR performance was pretty much as expected.

TR Simulation in GEANT4

Transition Radiation in GEANT4

*Mogens Dam
Niels Bohr Institute*

- Transition Radiation provided by G4 team
- G3 like implementation of TR
- Study of TR implementation; test beam comparison
- Some details on ionisation model (PAI) ; comparison G3/G4

Work reported: MD & Jakob Langgård

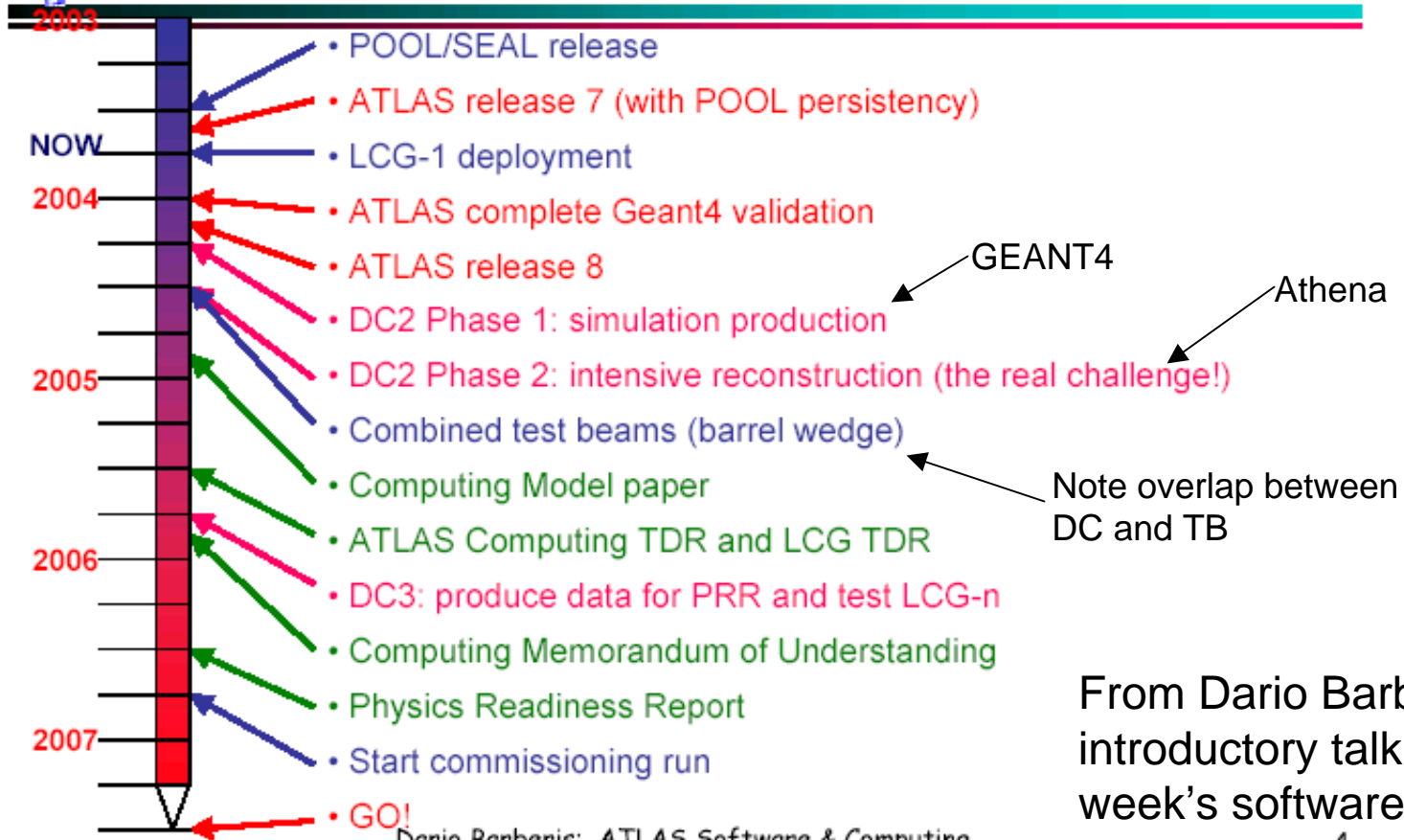
From Mogens' talk about
simulating TR in GEANT4.

DC2 and Combined TB Overlap

ATLAS Software Week - 22 Sep. 2003



ATLAS Computing Timeline



Dario Barberis: ATLAS Software & Computing

From Dario Barberis' introductory talk at last week's software workshop.

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Release 8.0.0 & DC2

- Release 8.0.0 of the ATLAS software will be used for data challenge 2.
 - Release 8.0.0 is planned for February 27 2004.
 - Data challenge 2 will be in two parts:
 - Phase 1: Event simulation using GEANT4 (Starts in April)
 - Phase 2: Reconstruction using Athena (Starts in June)

This is a direct schedule conflict with the combined TB!

- The major goals for DC2 are:
 - Full detector simulation using GEANT4
 - Persistency of hits and digits using POOL
 - Pileup in Athena
 - Implementation of Recon Task Force Recommendations
 - Use of GRID for batch and Python for interactive

This is a very aggressive work plan / schedule.

Software Work for Combined TB

- There is a long list of software jobs for the combined testbeam. Here are the current tasks:
 - **Monitoring:**
 - ROD-based monitoring
 - Standalone monitoring
 - Athena-based combined monitoring
 - **Database:**
 - Identifying data needs to be stored
 - Contact with rest of the project
 - **DCS**
 - **Calibration**
 - **Event display**
 - **Offline:**
 - Reconstruction of TRT Data
 - GEANT4 Monte Carlo
 - Comparison with GEANT3

Combined Testbeam

- Next year's testbeam will be split into two parts:
 - A “technical” run in May-June used to install and understand the detectors in the beamline.
 - Standalone TRT monitoring is OK.
 - Certainly will be some work on Athena monitoring
 - A “physics” run in August-September used to actually study running the combined system of detectors.
 - Should have working Athena-based monitoring for combined use.
- The TRT offline community believes that the amount of work is large and that the work plan should be doable with the number of possibly available people:
 - Chafik, Fido, Mogens, Daniel, Peter, Paul, FL, Ken, Jolanta, Roberto, Ole, Anatoli, Serge, Vladimir, Andrei, Yura + NBI student?
- ATLAS management puts an extremely high priority on the success of the combined testbeam.

Combined TB Database

- Developing a database containing the full set of TRT information is potentially a large effort.
 - Having this information is required for both testbeam and real ATLAS operation.
- We need to generate a list of what information the database will contain.
 - It is much more pressing to identify what TRT information the database must contain then to choose a database system.
- We need to decide whether we need a TRT database coordinator and if so the scope of the job.
- For now, this “hot potato” has been assigned to Serge Sm. and Daniel who will try to have a skeletal working document in a couple of weeks.

Monitoring

- We want a standalone monitoring (based on existing code) to guarantee that we can setup our hardware.
- Three separate monitoring areas:
 - Rod-based monitoring to confirm ROD data integrity
 - Should be fast & simple...
 - Primarily for making sure that readout hardware is working properly
 - People: Paul, Ole
 - Standalone monitoring
 - Code reusable for Athena-monitoring?
 - Needs to deal with the practicalities of monitoring 420,000 straws
 - Does this read data from a ROD spy stream or does it run in the crate?
 - People: Serge Sm, Paul
 - Athena-based combined monitoring
 - Based on offline
 - Needs to deal with the practicalities of monitoring 420,000 straws
 - People: Roberto, Peter?

Getting Offline Data into Athena

- Daniel suggested the following possibility for getting data into Athena:
 1. Start with this past summer's data since it is very similar in format to the official DAQ format.
 2. Convert it to bytestream format.
 - People: Serge Sm with help from Andrei and Yura.
 3. Run RDO converter.
 4. Try to reconstruct the tracks using xkalman++ & Athena
 - Use a simple external seed initially
 - People: Vladimir, Roberto
 - This will require treating Si telescope data as data from a “fake” subdetector (could use average beam track initially).
 - A similar path will be used for the TB GEANT4 simulation.
 - Roberto will probably be the Athena monitoring contact.
- The goal is to have this working with both Monte Carlo and 2003 TB data by the Christmas break.

Summary

- We have two big jobs:
 - Preparing for DC2
 - Preparing for the combined testbeam
- We need to designate contact people for tasks:
 - Database content (urgent – what is scope of position?)
 - Alignment
 - Athena monitoring
 - Calibration
 - Event Display
 - Others?
- Additional workers are needed...