From Frascati WS to the TDR

M. Morandin - INFN Padova

Computing groups activities so far

- main current effort: provide tools and support for the successful production of the detector (and machine) TDR
  - Fast simulation
  - Full simulation
  - Collaborative tools
  - Code developments tools
- longer term effort: preparation of the computing TDR
  - current activity: SuperB Computing planning group

Frascati Workshop (15-17/12/08)

[http://agenda.infn.it/conferenceOtherViews.py?view=standard&confId=850]

- core of the workshop

  - parallel sessions on fast and full simulation

- but also:

  - session on "The future of SuperB computing"

    - first report of the SuperB planning group

  - more general issues were addressed:

    - coordination of fast and full simulation

    - software devel. tools

and something more

- WS was also opportunity for the
  - first meeting of the Geometry Task Force
  - discussion on electronics/DAQ/trigger
    - new people joined the group and then contributed to the follow-up discussion
    - overview of technologies used at LHC (CMS, LHC-B)
  - first Fast simulation tutorial
    - ~ 10 people attended
    - could probably be repeated if needed
      - also remotely, INFN has made some investment in e-learning tools (Adobe Connect)

FastSim tutorial

- Led by D. Brown on Monday afternoon, based on FastSim V0.0.1
- Interactive: step by step, with attendants following live instructions.
- From release setup to simulation of B->D*K decays in a tunable SuperB-like environment.
- Use of event display
- Positive experience. Another one at the Feb '09 meeting?

A. Suzuki
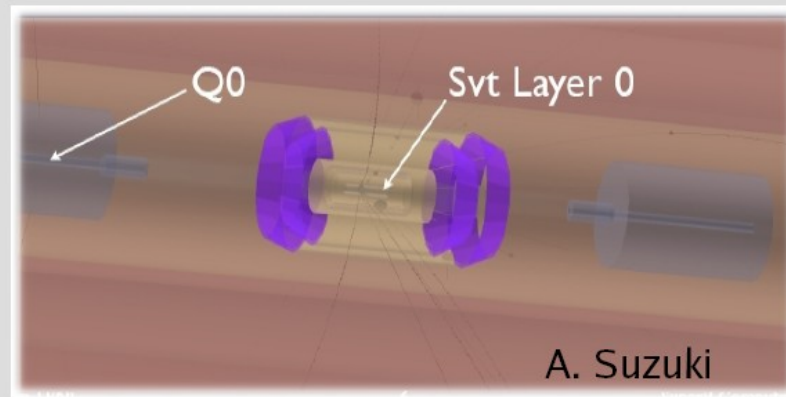
Fast Sim

Summary

- Fruitful meeting for FastSim: initial goals have been met
- New activity on PID selectors started
- Still open issues on shower simulation. This is a difficult task which will require additional work and ideas
- First-time major input from users
- In a number of case FastSim is already performing well

Full simulation

GREAT MEETING!

- Traced the plan of activities for the next month

- First contacts with PID people to include the [...] the backgrounds analysis.

- Very good and promising new ideas:

  - Python to access Geant4 internals @ runtim[e]

  - geometry sincronization (fast ↔ full)

  - backgrounds frame superposition (fast sim)

MAN POWER ISSUES

- IR GDML-ization?

- Book keeping?

- Job submission and management?

- Digitization?

- Goal for the Paris meeting:
  produce and analyze a bigger background sample

- Mid of january: preproduction of a small sample to

  - Exercise Bruno (Eugenio, Andrea, Roberto)

Coordinating Fast and Full simulation

Detector Description

- Merger of GDML and EDML ?
  - both XML-based
  - different scope
    - GDML=simulation, EDML=s
- Generate EDML fro
  - Simplification of geo
  - introduction of meas
- Generate GDML fro
- Comparison of EDM
  - Find inconsistencies

David Brown, LBNL

Background Frame

- Need full simulation to describe machine backgrounds
  - Details of beam elements important
  - Huge number of particles
- How to describe background
  - Localized energy deposits?
  - Trajectories of particles?
- How to represent background in code
  - root trees?

David Brown, LBNL   3   Fastsim Meeting

Computing Planning group

G. Dubois-Felsmann, F. Bianchi, D. Brown, P. Elmer, M. Morandin, R. Stroili

- to define:

  - A notional **timeline for the development of the SuperB computing project**

  - Goals for what should be included in **the main detector and collider TDR** with respect to **computing**, and what should be deferred to an additional **computing-specific TDR** that might be published a year or two later than the main TDR

  - **Directions for computing R&D** for SuperB in the near to medium term; **evaluation of resources** needed to accomplish the R&D program and the computing TDR

First report during at Frascati

- Introduction by G. Debois-Felsmann
- Talk by D. Brown on shorter term activities:
  - Exploiting BaBar software legacy
- Talk by P. Elmer on longer term activities
  - R&D SuperB computing program

Baseline time profile

- **Phase 0:** [now --> mid-2009]

  - **definition of R&D plan; report to an all-hands SuperB workshop mid-2009; continued development of simulation tools**

- **Phase 1:** [mid-2009 --> mid-2011]

  - **major R&D program for SuperB computing; invitation to new people/ideas; continued support and development of simulation tools**
  - **at the end, computing TDR complete or largely so**

- **Phase 2:** [mid-2011 --> end-2013]

  - **integration of R&D program results into a complete SuperB software system; major online software development gets under way; series of data challenges; retirement (?) of phase 0 tools**

- **Phase 3:** [end-2013 --> 2015]

  - **scaling tests and development; converging on final full-scale system; acquisition of hardware**

- **First beams**

Emphasis on performance

- We have agreed on a shift in emphasis toward **designing for performance at an earlier stage** of the project than was feasible in BaBar.

- We also agree on the importance of **making available to physicists training in designing for and measuring performance**, so that the burden does not have to be carried entirely by computing professionals.

I INFN International School on

"Architectures, tools and methodologies for developing efficient large scale scientific computing applications" - ESC09

Bertinoro (Italy)
12-16 October 2009

R&D program

- The time scale of SuperB is such that there are probably 2-3 years in which some amount of "R&D" work could be done, in parallel to TDR work.

- In this presentation I'll cover a few things that would be reasonable proposals for such work, assuming:

    - That some amount of dedicated effort is available, separate from effort for the TDR, o(a few FTE?) say

    - That completely "blue skies" R&D is not what one is really looking for, but rather R&D that leads concretely to choices that could be "closed out" as concrete implementations/choices/design-decisions by 3-4 years before data-taking when a post-TDR, "ramp-up of software development" period starts

- There are three areas that are probably interesting (and they are somewhat related):

    - General code performance issues

    - Multicore CPU issues

    - I/O and storage issues

NFN Pd

Feedback from audience

- remembering the old BaBar days it was pointed out that, besides performance, it's important to consider from the beginnig also the users point of view:
  - **usability of the tools**
  - **support for non-experts**
  - **need for interfaces that can make learning curve less steep especially for newcomers**

- we feel that also these topics should be addressed already from the R&D phase

What's new since December

- much will be presented in the following talks

- let me just mention some good news

- first of all we have tried to:
  - boost the effort on collaborative and administrative tools
  - start setting up a computer core SuperB team at LNF

- made good progress on both aspects with the involvement of a new group led by Fabrizio Murtas
  - Fabrizio has been already collaborating with SuperB for the luminosity measurements at Dafne
  - he is the person in charge of the INFN Data Web group which manages several central services (INFN Web portal and associated services, scientific databases, outreach, Indico, etc.)

GRID and distributed computing

- **more good news**
  - a new team formed with colleagues from :
    - Ferrara, consolidated Grid expertise (E. Luppi, L. Tomassetti)
    - at CNAF - Tier1 (A. Fella)
  - short term goals (months):
    - provide access to standard SuperB simulation tools
      - to have a site (CNAF) where any SuperB user can login and run simulation jobs
      - exploit in parasitic mode CNAF Tier1 resources
    - start exploiting the INFN and worldwide GRID
      - be ready for possible very large full simulation production
      - investigate why not using the GRID to run also SuperB machine simulations

Next steps

- request for a new SuperB Virtual Organization has been submitted

  – should be activated by mid-March

- users login enabled in a few weeks from now

  – immediately for BaBar users

  – by end of March for all users

    - a digital certificate issued by the national C.A. will be needed

- GRID enabled sim. production in two months

Mailing lists

- SuperB@lists.infn.it
  - SuperB project general mailing list
  - 141 subscribers

- SuperB-computing@lists.infn.it
  - Super-B computing general mailing list
  - 40 subscribers

- SuperB-fastsimu, SuperB-fullsim, ...

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final topic: PI list

- this list will be activated soon and it will form the basis of the SuperB administration DB

- it's going to be important for ensuring that

  - all institutions have a contact person

  - all members of an institution have subscribed to the SuperB list

  - new requests are validated by the PI

- I suspect it's still not complete

  - if your institution is not represented, let me know

current PI list (I)

Canada

Carleton University	David Asner
McGill University	Steven Robertson
TRIUMF	Robert Henderson
University of British Columbia	Chris Hearty
University of Victoria	Michael Roney

Italy

... [17] ...   ... [29] ...

France

LAL   Achille Stocchi

Russia

BINP   Yuri Skovpen

current PI list (II)

Spain

Universitat de Barcelona (UB)	Eugeni Grauges Pous
IFIC, Universidad de Valencia-CSIC	Fernando Martinez-Vidal

UK

Queen Mary, University of London	Adrian John Bevan
University of Warwick	Tim Gershon
University of Liverpool and the Cockcroft Institute	Andy Wolski

US

LBL	David Brown
University of Cincinnati	Brian T. Meadows
University of Cincinnati	Mike D. Sokoloff
Caltech	Frank C. Porter
SLAC	David Aston