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On behalf of the SuperB Computing Group

SUPERB COMPUTING STATUS

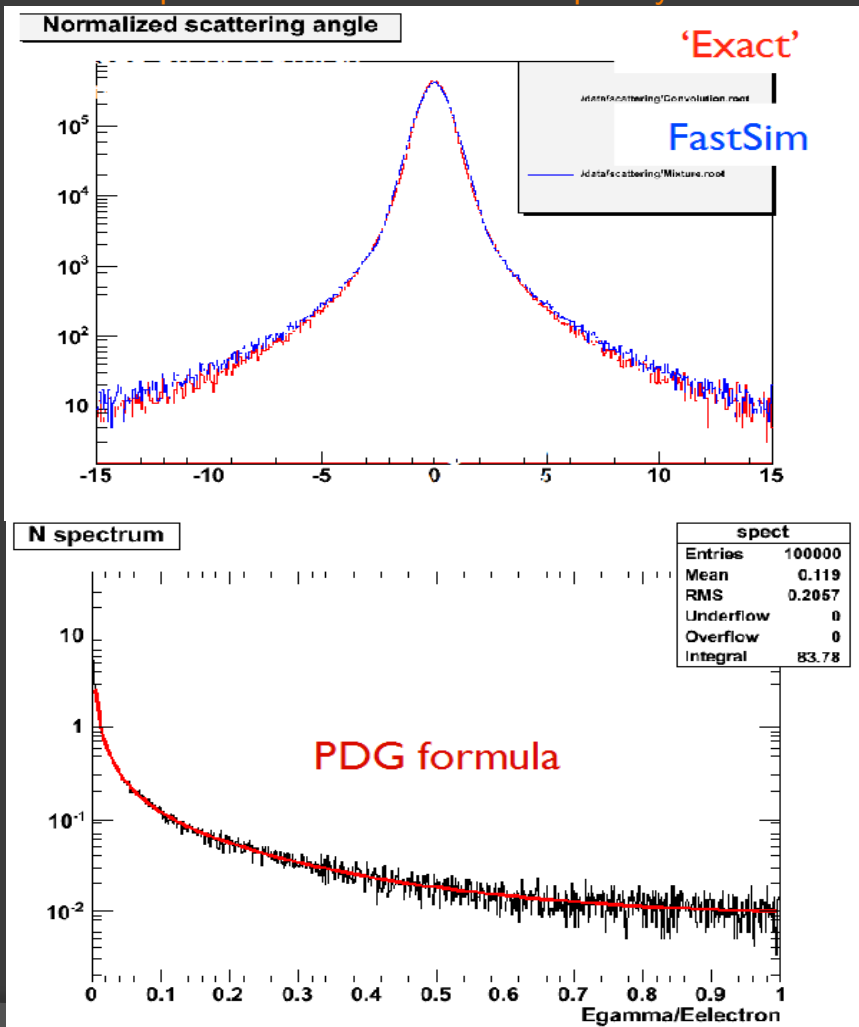


Outline

- FastSim
- FullSim
- Distributed Computing
- Collaborative Tools
- Building Tools
- Conclusions

FastSim improvements

See presentations at Det+Comp+Phys: FastSim+Detector session on Tue 5 Apr. 17:00 - 18:30



- Improved model of multiple scattering
 - Plus corresponding improvement in Kalman fit
- Improved (fixed) model of Bremsstrahlung
- Improved looper hits
 - Add "top-of-arc" hits
- Improved (fixed) model of DCH hit overlaps
 - Old: hit merging
 - New: early hit wins

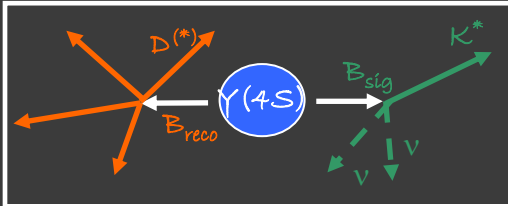


FastSim open issues

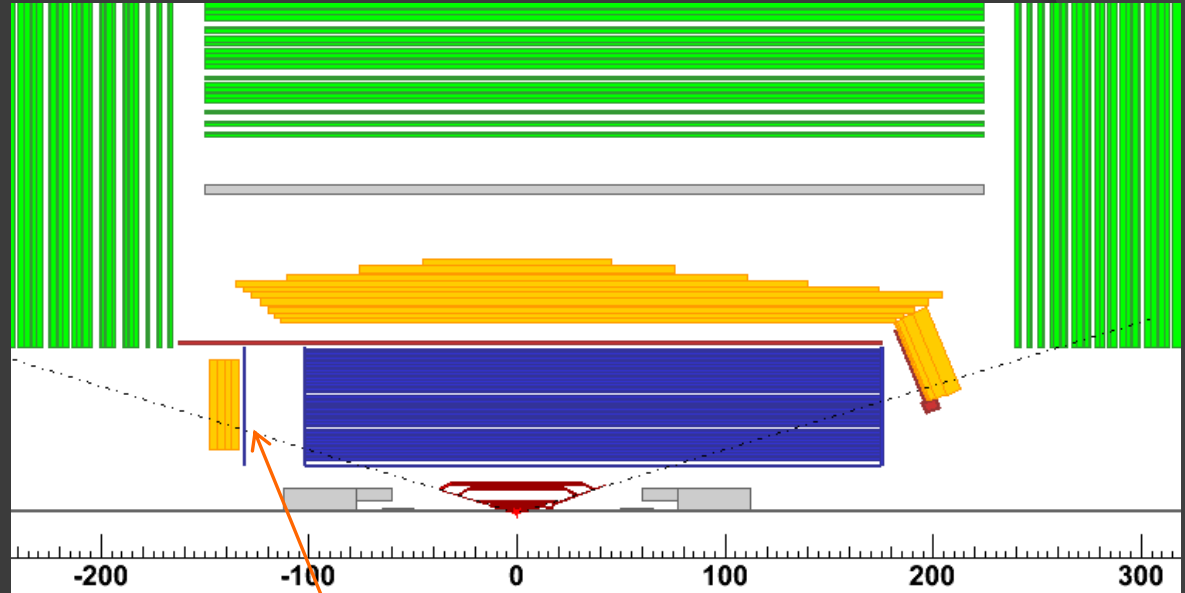
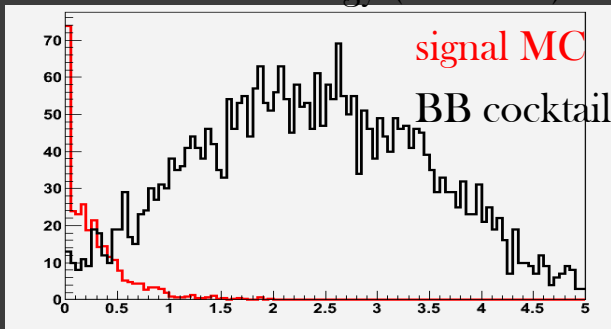
- Fix pattern recognition confusion model in Si
 - Existing code broken by fix to 'top-of-arc' problem
- Add Si triplets readout model
 - Angled strips
- Physics tools specialized for SuperB
 - Tagging, vertexing...
- What is needed for Physics TDR?
 - To be discussed during this meeting

Recoil analysis: detector geometry studies

See presentations at EMC session on Mon 4 Apr. 15:00 - 16:30 and Det+Comp+Physics session on Tue 5 Apr, 17:00 - 18:30



neutral Extra Energy ($B \rightarrow K^* \nu \bar{\nu}$):



- Updates on impact of Bwd EMC used as veto device in recoil analysis:
 - use September_production ntuple: DG_4, nopairs
 - background characterization: SLRecoilCocktail, HadRecoilCocktail
 - signal MC samples: SemiLepKplusNuNu, BtoKstarNuNu



FullSim improvements since Caltech

See presentations at Detector: Background session on Tue April 5th. 15:00 – 16:30 and
Det + Comp: BG + FullSim session on Wed April 6th. 11:00

- Several checks on different Geant4 versions (9.2 → 9.3) (S. Germani, D. Lindemann)
- Beam line modeled up to the first dipoles of the beam lines (+/- 16 m from the IP) (A. Perez)
- New shields in place: (A. Perez)
 - Tungsten shield is extended
 - Plug (forward region)
 - Horseshoe (backward region)
- Detector hall (concrete wall) for FEE studies of the radiation dose, single upset events etc. (E. Paoloni, A. Perez)
- DCH step length reduced to 1 mm (multiple scattering in low density material) (R. Cenci)
- Subsystems FEE modeled for radiation dose studies (R. Cenci)
- More realistic FTOF & bkw EMC (L. Burmistrov)

FullSim core developments

See presentations at Det +Comp: BG+FullSim session on Wed 6 Apr. 11:00 - 13:30

- Main focus now is to support ongoing detector studies
 - This implies, from time to time, new feature requests
- Recent examples include
 - Processes for optical photons
 - More flexibility in tuning the physics list



Optical photons

- Optical photons are created in G4 by specific processes (such as Cerenkov effect or Scintillation)
 - Bruno now has full support for Cerenkov
 - Bruno also provides facilities to define the refraction index for the radiator
- Once created, optical photons undergo a special set of processes (absorption, reflection, refraction,...)
 - These require the optical properties of the surfaces surrounding a volume to be known, in addition to the properties of the bulk material
 - Bruno has now an interface to define such optical surfaces
- Documentation on the Wiki page [Geant4 SuperB simulation main portal](#)

Tuning the physics list

- Use case presented by DCH
 - Switch on/off individual physics processes on a per-volume basis
- Similar functionality is now implemented in Bruno, by means of “Physics Recipes”
 - Allow to tune the physics list with needed granularity
 - **Caveat:** this is potentially very dangerous. Do not use it unless you know what you are doing
 - you may severely harm the reliability of the simulation
- Documentation on the Wiki page [Geant4 SuperB simulation main portal](#)

Production tools work status

See presentations at Distributed Computing session on Mon 4 Apr. 17:00 - 18:30

- Production tools version 0.2 is under construction
 - Signal handling management of critical statuses – Done
 - Data handling procedures via LCG-Utills – Done
 - GANGA submission engine optimization – Done
 - Grid authentication setup in job/bookkeeping – Testing
 - Job monitor development based on EGI services – In progress
 - Moving to a more efficient DB ER schema – In progress
 - Web portal recoding with templ php library - In progress
 - Job script porting from bash to python - In progress
 - Data distribution: via job/Grid service – In progress
 - FullSim production access to distributed environment – In progress

User tool for Grid access

- ◉ GANGA system allows the user to exploit EGI Grid resources
 - Job submission CLI/GUI - **Under testing**
 - On line job monitoring CLI/GUI – **Available**
 - Moving to multi Grid flavors exploitation in a second phase
 - **Testing GANGA submission at CNAF**
- ◉ Developing a SuperB specific GANGA plug-in is under evaluation to allow:
 - Integration with SuperB specific environment
 - Integration with user job “bookkeeping” DB



Site setup status

- 18 sites are enabled for SuperB production nowadays
- Recently joining
 - Ohio Supercomputer Center (OSC)
 - Status: **Testing**
 - Oxford University
 - Status: **Completed**
 - Caltech Computing Center
 - Status: **Completed**



Production Status

- Three FullSim productions since Caltech General Meeting (2011_Full-CIPE_mk1, 2011_Full-CIPE_mk2, 2011_01_full_xchecks)
- 50k evt, 2000 jobs, 200GB disk occupancy each
- 280k evt, 3000 jobs, 90GB disk occupancy, for full_xchecks
- CNAF UI (bbr-serv08, bbr-ui) will switch to ui01-spb and ui02-spb in April (notice will be broadcasted before the change)

SuperB Production Manager

Home Shift Time Table Elog FastSim FullSim Logout

Logged In as: Armando Fella, member of 5 group(s): webui, webuiFastProdMgr, webuiFullProdMgr, webuiShift, WebUIDeveloper

Production Monitor [full]

FULL PRODUCTION SERIES

Production Series:

Production Series:	2011_01_full_xchecks
Production root:	/storage/gpfs_superb/prod/
TAG:	V00-01-16
Revision:	401
CNAF Test Release:	/storage/gpfs_superb/prod/FullSim_workdir/BrunoProd-2011_Geant_CrossChecks/
Note:	

JOB STATS

Status	# of jobs	events
done	2 213	219 326
failed	29	52
running	24	2 302
submitted	2	200
sys-failed	483	48 201
Total	2 751	270 081

Total wct run: 27 648 197 s (0.877 yr)



CNAF operations

- Available SuperB User Interfaces (LSF/Grid), SL5 x86_64
- Enforcing reliability actions for production services
- CNAF lends 16TB/50TB added to gpfs_superb
- CNAF FTS (File Transfer Service) is configured at CNAF, available CNAF-IN2P3-CC channel
- Split up BaBar and SuperB accounts
- New user storage area
- LSF and Grid submission are now available
- Superb queues still available to both experiments

Alfresco Document Manager Status

See presentations at Collaborative & Software Management session on Tue Apr 5 15:00 - 16:30

- Alfresco Document Manager is up and running at <http://sbdocserver.pd.infn.it:5210/alfresco>
- Authentication and group mapping is done through sbldap.fe.infn.it
- Groups to identify users from different divisions are available (only the Computing group is already populated)



Alfresco Status (cont'd)

- Spaces for each division are available, with the ability to delegate coordination role to «division managers»
- A default document approval workflow defined for each division
- Documents previously accessible through the collaboration website (internal notes, presentations and reports) were imported in the Alfresco Repository
- **Ready to be tested by collaboration users**



Collaboration Website

- Transition to LDAP authentication completed
 - LDAP Groups available to identify different roles (Users, Authors, Managers and Administrator)
 - All the old local users were deleted

Alfresco Share

- Share is the Alfresco tool designed to allow content sharing and collaboration inside a project team.
- Online
 - <http://sbdocserver.pd.infn.it:5210/share>
- Same authentication chain of Alfresco DM (sblldap + local)
- Ready to be tested by the Computing group users (and eventually others)

Building Tools Status

See presentation at Collaborative & Software Management session on Tue Apr 5 15:00 - 16:30

- CMake added as alternative build system (Makefile generator) to FastSim V0.2.7
 - Based on CMake 2.6 and available for build on SL4, SL5 (32 and 64 bit) and MacOS
 - **It doesn't substitute but works in parallel with SRT**
- CMake build managed by a shell script
 - Copes with initial build configuration
 - Replicates some SRT behaviours (as regards make installdirs)
 - Still lacks other features (script management, initial setup)



Building Tools Status (cont'd)

- ⦿ Provides Release and Debug builds
- ⦿ Still coupled to some SRT features
 - Build dependencies calculated starting from `link_X.mk` and `bin_X.mk` files
 - Management of placeholders for external libraries (ROOT, CLHEP) to be improved
 - Previously made with `arch_spec_*` files



Building tools plans

- Decouple CMake build system from SRT
- Extend build platforms as required
- Investigate automatic build frameworks
- Extend the usage of CMake to FullSim



Conclusions

- There's a lot of work ongoing
 - Many FastSim and FullSim improvements
 - Many improvements and developments on the distributed computing infrastructure
 - Essential for MC productions needed for detector studies
 - Many activities on collaborative and core computing tools



Conclusions (cont'd)

- The funding of the project has for sure boosted efforts and enthusiasm
- But to be productive they need:
 - People (groups are still undersized and projects/plans/ideas are growing)
 - Coordination
 - Every aspect of the computing projects is tightly coupled to the others
 - Intensify communication and comparison among computing groups