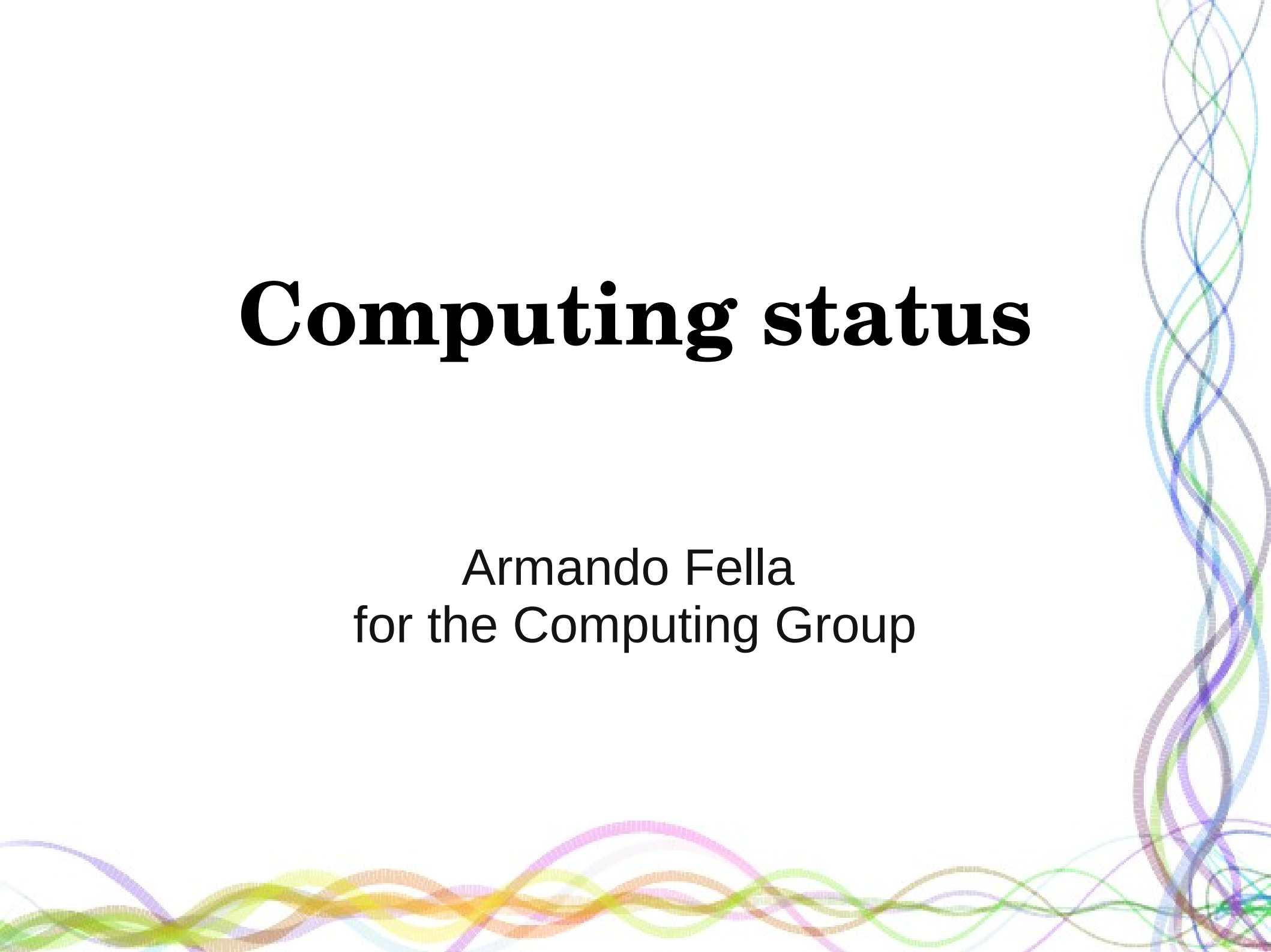


Computing status

Armando Fella
for the Computing Group



Topics

- Full Sim production
- Distributed production system status
- FastSim developments and first results
- Report from II Computing Workshop
- Conference status CHEP, IEEE-NSS
- Goals of the workshop and conclusion

Background simulation status

- Improvements of the SuperB Geant4 model
 - Better model of the SVT (R.Cenci). Finally there are 8 realistic modules instead of a single unrealistic cylinder :)
 - Latest IR design from Mike & lattice parameters from Panta(Alejandro)
 - Beam pipe modeled up to the first dipole ~12 m from the IP
 - Better beam pipe model at the IP (R.Cenci)
- Improvements of the Bruno software (Alejandro)
- Check of the correctness of the magnetic model (Alejandro): both the old IR model (P3) and the latest one are in good agreement with Mike simulations

Bkg simulation production

- Radiative Bhabha production

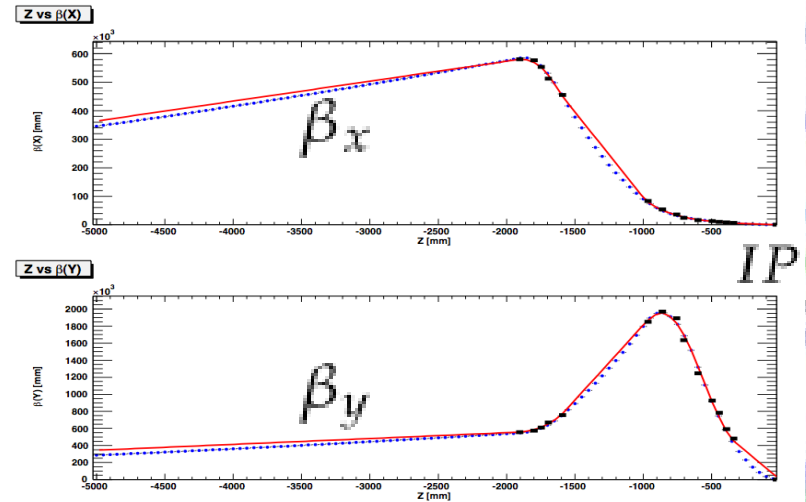
- ~ 1 M bunch crossings

- ~ 25000 CPU hours

- 463 Gbyte written on disk

- Quality checks and analysis in progress

- Pairs: bigger sample (1.9 M) produced by Alejandro and at present under analysis



Mike's SF10 simulation results
(Black Squares and red curve)
vs. Geant4 (Blue points)



- **PLEASE JOIN THE MDI & BACKGROUND MEETINGS TO SEE THE RESULTS**

E. Paoloni

Production system status

- **Integration** of FastSim and FullSim production tools
- A simple script, Grid compliant, for **data transfer**, site to site, have been developed (2TB/day)
- Production **tools consolidation** in progress (long todo list)
- Pre production FastSim and FullSim **validation procedure not implemented**
- Start thinking “**Distributed production system PnP**” project:
 - **Generic, autonomous and EGI compliant distributed production system for medium and small Virtual Organization (experiments/groups)**

Production tools integration

- Unique web portal for Full and Fast Sim production management:
 - FastSim prod services:** Initialization, Submission, Shift control page, eLog system, physics request management, monitor
 - FullSim prod services:** Initialization, Submission, monitor

The image displays two side-by-side screenshots of the SuperB Production Manager web portal. Both screenshots show the 'FULL PRODUCTION FORM' with the following fields:

- Production Series: 2010_full
- Production root: /storage/gpfs_superb/prod/
- TAG: V00-01-14
- Revision: 391
- CNAF Test Release: /storage/gpfs_superb/prod/FullSim_workdir/
- Note:
- Minimum Run Number: 100000
- Software Revision: 391

The left screenshot shows the 'FullSim' dropdown menu with options: Production Full Init, Production Full Monitor, and Production Full Submission. The right screenshot shows the 'FastSim' dropdown menu with options: New Production, Production Requests, Expert Init, Shift Init, and Production Monitor.

Production system capability

FastSim productions	Sept. '09	Feb. '10	Summer '10
Analysis stream	2	5	6
job done, failure rate[*]	5K, 10%	20K, 8%	166K, 10%
Number of event	2.25×10^8	1.6×10^9	9×10^9
Involved site	1	9	15
WallClockTime (year)	6	19	195
Disk occupancy (TB)	0.5	5	25
Peak job in running state	500	2500	7000

● **SEE PRESENTATIONS AT COMPUTING PRODUCTION SESSION ON WED 15 DEC. 14:00 - 15:30 ROOM: B237 - BAXTER ROOM 237**

[*] Mostly due to Grid infrastructure and site problems

The production team

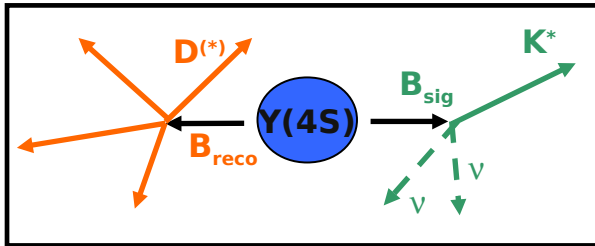
- A. Fella
- **Matteo Favaro** (New degree student at Ferrara)
- M. Manzali
- L. Tomassetti
- **Laura Vettorello** (New degree student at Ferrara)

FastSim work since October

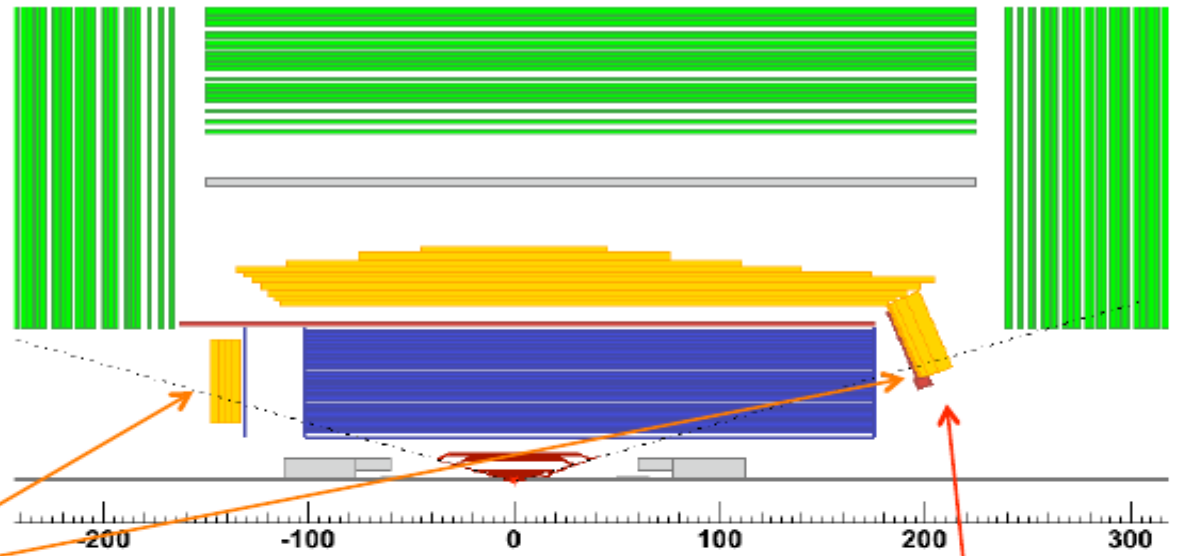
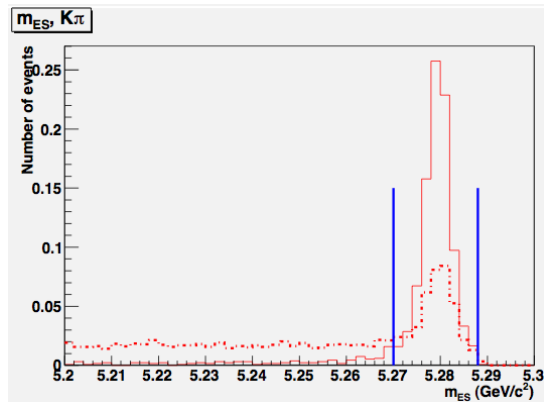
- Top-of-arc problems addressed
- Fix flaw in multiple scattering (log term)
- Code cleanup
 - Improve measurement interface
 - Simplify edm1 (xml) config description
 - Refactorize hit merging and pat. rec. confusion
- Plan for release of public FastSim package
 - New public svn repository in Padova (FastSim)
 - Renaming of classes and packages
 - Removal of BaBar, SuperB dependencies
- ***SEE DAVE'S TALK "FASTSIM DEVELOPMENT STATUS AND PLANS" DURING 11:00-12:30 COMPUTING - FAST SIMULATION SESSION ON THURSDAY 16***

D. Brown

B → K* νν vs HAD tag: detector geometry studies



SEE ELISA MANONI'S TALK @ TODAY DGWG I SESSION



* Impact of Bwd EMC & FWD PID:
 DG_4, all backgrounds
 HadRecoilCocktail + BtoKstarNuNu

* Impact FWD PID material in front of FWD EMC:
 DG_4a, no pairs, HadRecoilCocktail + BtoKstarNuNu
 DG_4, no pairs, HadRecoilCocktail + BtoKstarNuNu

Report from II Computing WS

- 16-17 November 2010 @ CNAF, Bologna, Italy
- Treated topics:
 - **Distributed Storage systems**
 - LHC experiences
 - Test in progress in Napoles and Bari:
 - Hadoop, xRootD new features,
 - New system evaluation
 - **Report from conferences: CHEP, HEPiX**
 - **Compilation/building tools**
 - **Collaborative tools**

Distributed storage system

- Related presentations:
 - Hadoop experience at Naples
 - xRootD/Lustre comparison using CMS analysis jobs
 - ALICE storage model
 - CEPH: is it an interesting solution in a long term future?
 - LHC data for Tier0 and analysis
 - A testbed for the SuperB computing model
 - I/O Advances in CMSSW
 - Data management in HEP

Testbed setup at Naples and Bari
respectively managed by:
Silvio Pardi and Giacinto Don Vito

Status of FastSim build system

The plan is to start working with Cmake support for FastSim release operations in January 2011.

CMake features include:

1. Full automation build task of software release
 2. Can build a single package or bunch of packages based on a given Release
 3. Support for Linux SL4 and SL5. Still problems with Mac OSX
- Cmake lists files in place for every FastSim package
 - Many CMake macros and scripts availability for release configuration tasks are available:
 - Third party packages configuration and management (CLHEP, Root, Boost)
 - Specific platform settings (compiler definitions and flags)
 - Bash script to run cmake executable in a more friendly way

More work needed to provide full support for different OSES

Build system: future plan

Future plan includes developing prototypes with CMake combined with CPack, CTest and Cdash utilities:

1. CDash

- Alarm system based on email notification when build events occur
- Test environment already set up

2. CTest

- Useful also combined with Valgrind to perform code profiling
- and to submit build results to a Cdash

3. CPack

- CPack can be used also without CMake as a standalone tool
- Same syntax as CMake
- Support for many different package generators (RPM, Debian, OSX, Cygwin)

Collaborative tools:

Alfresco Document Manager

- **Open source** software written in Java (supporting different DB backend)
- **Document repository** implemented with a directory-like structure
- Access to repository available through **web interfaces** or as shared drive
- **Document level security**. Local or remote users/groups management
- Internal Google-like **search** and Yahoo-like **category browsing**
- Allow rules definition on repository sub-spaces (automated actions)
- Support **document versioning and auditing**
- Support **discussion forums**
- Enable **document workflow management** and format transformation
- User notifications available through e-mail or RSS feeds
- Interaction with other software available through CMIS (Content Management Interoperability Services) or web services

Collaborative tools: present status

Alfresco Document Manager is online at:

<http://sbdocserver.pd.infn.it:5210/alfresco>

- **Centralized SuperB authentication** (uthentication through sbldap.fe.infn.it)
- Data dictionary **extended to support SuperB specific** documents (internal notes, presentations, pubblications and reports)
- Space configured for document approvation process («**SuperB - Document Approvation Space**»)
- **Repository available** to store approved documents («SuperB Documents»), divided by topic and type
- **Implemented approvation workflow**, automatic tagging and document transformation rules

S. Longo

Collaborative tools: Future plan

- The document repository is online and available for all SuperB users.
- **We plan to:**
 - **Move all the documents already produced by the collaboration into Alfresco Document Manager**
 - **Integrate Alfresco Document Manager into the existing SuperB website**
 - **Switch to Alfresco web interface for the submission of new documents**
- Then we will collect user comments on Alfresco to enhance its usage

Conference contributions

● CHEP 2010, Taipei, Taiwan, 18-22 October:

- Oral presentation, “Computing for the Next Generation Flavour Factories”, Morandin, Fella, Gianoli, Rama, Brown, Luppi, Corvo, Paoloni, Di Simone, Bianchi, Tomassetti
- Poster, “The Distributed Production System of the SuperB Project: Description and Results”, Brown, Corvo, Di Simone, Fella, Luppi, Paoloni, Stroili, Tomassetti
- Poster, “Fast Simulation for SuperB Detector and Physics Reach Studies”, Brown, Rolf, Arnaud, Burmistrov, Cheng, Di Simone, Gaponenko, Manoni, Perez, Rama, Roberts, Douglas, Rotondo, Simi, Stroili, Sokoloff, Suzuki, Swersky, Walsh

● IEEE-NSS 2010, Knoxville, Tennessee, USA, Oct 30th -Nov 6th :

- Poster, “First results from the SuperB simulation production system”, Brown, Corvo, Di Simone, Fella, Luppi, Paoloni, Stroili, Tomassetti
- Oral presentation, “FastSim: fast simulation of the SuperB detector”, Andreassen, Arnaud, Brown, Burmistrov, Carlson, Cheng, Di Simone, Gaponenko, Manoni, Perez, Rama, Roberts, Rotondo, Simi, Sokoloff, Suzuki, Walsh

● **SEE CONFERENCE REPORT PRESENTATIONS IN COMPUTING R&D SESSION:
ON WEDNESDAY 15. 14:00 - 15:30**

WS Computing Sessions

Wednesday, 15 December 2010	
09:00	[67] Distributed Storage R&D by Giacinto DONVITO (INFN) (B25 - Baxter Room 25: 09:00 - 09:30)
	[68] Report from CHEP by Armando FELLA (CNAF) (B25 - Baxter Room 25: 09:30 - 09:50)
10:00	[69] Report from IEEE by Luca TOMASSETTI (FE) (B25 - Baxter Room 25: 09:50 - 10:10)
	[70] Discussion and Planning (B25 - Baxter Room 25: 10:10 - 10:30)

- Goal: discuss the follow up of the II R&D workshop looking forward to the Computing Model design definition for TDR

Wednesday, 15 December 2010	
14:00	[78] Production status by Luca TOMASSETTI (INFN-Ferrara) (B237 - Baxter Room 237: 14:00 - 14:20)
	[82] Distributed production system PnP by Armando FELLA (B237 - Baxter Room 237: 14:20 - 14:40)
	[85] FastSim production status (TBC) by David BROWN (B237 - Baxter Room 237: 14:40 - 15:00)
15:00	[87] Personal production report (TBC) by Konstantin SHOUGAEV (SLAC) (B237 - Baxter Room 237: 15:00 - 15:10)
	[88] Discussion (B237 - Baxter Room 237: 15:10 - 15:30)

- Goal: discuss the next requirements in terms of production and production model. Define the work plan for 2011

Conclusion

- The prototype Distributed Production System is able to accomplish simulation requests in TDR phase
 - **New development on course**
- New results of worth coming from FastSim and FullSim groups in terms of development of new features and bug solving
- Works for Computing Model definition are in progress:
 - **Various distributed storage system layouts have been taken into account**
 - **Profitable collaboration with experts in Bari and Naples**
 - **Test of new solutions started**

Thanks, questions?

Multiple Scattering

- PDG
$$\theta_0 = \frac{13.6 \text{ MeV}}{\beta c p} z \sqrt{x/X_0} \left[1 + 0.038 \ln(x/X_0) \right]$$
- Describes Gaussian approximation to 98% core
- 11% accurate for $x/X_0 > 10^{-3}$
 - NB: 1cm Ar/Ethane has $x/X_0 \sim 10^{-5}$
 - **Cannot** be added in quadrature due to tails!
- FastSim was hardcoded to BaBar tuning
 - 2% 10X tails, $x/X_0 \sim 6\%$ in log term
 - Used in both simulation and reconstruction
 - **over-estimated** SuperB scattering (no support tube)
- Short-term fix: set x/X_0 to $\sim 2\%$ in log term
- Long-term fix: use full Moliere scattering model

Top-of-arc problems

- FastSim models DC layers as cylinders
 - Hits generated as particle crosses fixed radius
 - Material effects computed from 1st order calculation
- Particle at top-of-arc goes transverse to layer
 - multiple hits in a single layer
 - gas material given by arc through layer
- FastSim fixes
 - Compute gas path using 2nd order calculation
 - Generate # hits according to gas path
 - $N_{\text{hits in layer}} \cong \text{pathlength/cellsize} + 1$

D. Brown