

## ***Status of Muon CTB 2004 Simulation***

- *Geometry*
- *Hits*
- *Digits*

***Athena release 8.3.0***

***Simulation package:***

*Simulation/G4Sim/CTB\_G4Sim/CTB\_G4Sim-00-01-08*

***Muon TB package:***

*MuonSpectrometer/MuonG4/*

*./MuonG4TestBeam/MuonG4TestBeam-00-00-25*

***Database: amdb file***

*amdb\_simrec.H8\_2004\_CTB.a.02nobe*

# Geometry database development

## Database development (D.Pomarede)

- ***amdb\_simrec.H8\_2004\_CTB.a.01*** database for first porting of MuonG4Testbeam in the CTB\_G4Sim simulation (released on 04/02/04)
- *some test versions with improved description provided for testing to both MuonGeoModel and G4 people*
- ***amdb\_simrec.H8\_2004\_CTB.a.02*** includes all improvements of test version (released on 09/06/2004)
  - *dz correction for MDT*
  - *angles in "P" lines (positioner)*
  - *Spacers implemented as CrossPlates and LongBeams for all MDT chambers*
  - *correction of CSC and TGC description (as in layout Q)*
  - *dead material, ancillary detector and magnets*
  - *BEE chamber in front of calorimeter*

# Status of amdbfile geometry database

Hand-coded geometry (MuonSpectrometer/MuonG4/MuonG4Geometry) uses, as for now, a modified version of the amdbfile a.02 without the BEE chamber : **amdb\_simrec.H8\_2004\_CTB.a.02nabee**

- The BEE chamber in front of calorimeters will be present on the setup only for short time during August
- Simulation of this chamber requires complicated modification of the envelopes in the CTB\_G4Sim package

## NOTE:

- dead material, ancillary detector and magnets so far are implemented by Manuel Gallas in the CTB\_G4Sim package
- corrected information on the chamber positioning delivered. A test version of the amdbfile (**amdb\_simrec.H8\_2004\_CTB.a.03\_test1**) released on 25/06/04

# Geometry: recursive test

- **MDT** :
  - NO ERRORS
- **TGC**
  - NO ERRORS (thanks to Yoji Hasegawa)
- **RPC**
  - *solidProblem: spurious intersection point in RpcGasVolume and in RplayerStripSupport*
  - *overlap between some volumes*  
**STATUS: ADS informed**
- **CSC**
  - *Errors due to non-correct reading of the amdbfile layout (description as layout Q non yet implemented). Under development*

# Hit Production

- *Hit produced for all the technologies:*
  - *jobOptions.CTB\_G4Sim.py used*
  - *hit location saved in root file*
  - *read back and checked through ReadMuonSimHitsOptions.py jobO from MuonSpectrometer/MuonDigitization/MuonDigiExample package (tag 00-04-05)*
- *Hit relocation test for cross check between hand-coded geometry and MuonGeoModel implementation foreseen on short time schedule*

# Digitization

*Hit generation and digitization in two phases:*

- *Hit generated with standard CTB\_G4Sim jobOptions (python) and hit location saved in a ROOT file*
- *Hits read back and digitized*
  - *MDT and RPC digitization OK*
  - *TGC and CSC under investigation*

**See Daniela Talk on digitization**

# Conclusions

- *G4 Simulation of the Muon System section in the Combined testbeam is working in the CTB\_G4Sim package*
- *Geometry:*
  - *major problem solved*
  - *some recursive errors still to be corrected (under work)*
  - *hand-coded geometry (MuonSpectrometer/MuonG4/MuonG4Geometry) default for hit production until hit relocation test*
- *Hits generation is ok for all the four technologies*
- *Digitization ready for MDT and RPC, TGC and CSC under investigation*
- *The simulation/digitization of Muons sector is ready for data preproduction*