

Simulation Activities at MPI

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- Projects and tasks
- Simulation activities:
 - HEC stand-alone testbeam
 - combined testbeam of EMEC / HEC (2002)
 - combined testbeam of EMEC / HEC / FCal (2004)
 - ATLAS



Projects and Tasks

- **Geant4 physics validation**
 - note on the EM physics validation (version 4.1p01)
 - note on the hadronic physics validation (version 5.2p02)
 - version 6.1: significant problems
 - current version — **6.2p01**
- **Calorimeter calibration**
 - implementation of “calibration hits” in our codes
 - simulations and tests of the calibration tooling, algorithms
 - evaluation of calibration uncertainties for the HEC (EM-scale and hadronic scale)
- **HEC geometry**
 1. Old: very close to the HEC geometry in Geant3
 2. Montreal: “default” in ATLAS
 3. **New**: more realistic and more optimal for Geant4 simulations



Simulations: HEC Stand-Alone Testbeam

- Packages:
 - stand-alone code with old geometry (only at MPI)
 - LArG4TBHEC (in the stand-alone mode) with all three geometries
- Development and tests of the new HEC geometry
- Geant4 physics validation (version 6.2p01)
- Calibration issues:
 - evaluation of uncertainties (Geant4 and Geant3)
 - implementation of “calibration hits” ?



Simulations: EMEC / HEC Combined Testbeam

- Package `LArG4TBEmecHec` (in the **stand-alone mode**)
- Main task — **calibration**:
 - implementation of “calibration hits” done
 - first round of simulations (version 6.2p01) carried out
 - tests going on
 - comparison with experimental data (help from Sven Menke)
- Geant4 physics validation



Simulations: EMEC / HEC / FCal Combined Testbeam

- Package [LArG4TBEndcap](#)
- Our contributions / plans:
 - warm tail-catcher (geometry and digitisation)
 - beam chambers BPC (as passive material, at first)
 - implementation of “calibration hits”
 - tests within Athena or/and in the stand-alone mode
- Participation in “mass”-simulations ?



ATLAS Simulations

- No involvement yet...
- Our contributions / plans:
 - implementation of the new HEC geometry
 - tests of the calibration tooling

