Integration of B-field Map Measurements in the Software

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Introduction

- **B-field map of June 2005:**
  - **Mapping in the regions:**

    upstream between IP & TT, magnet, RICH1 photodetectors plane
  - **Mainly 8cm x 8xm x 10cm grid**
    - ***But x & y grid width can vary, and "holes" exist in the mapping***
  - **See Frederic's and Marcello's talks on B-field meeting of the 5th Oct.**

    for all details

- **B-field data in the software:**
  - **field045.cdf file with simulated data on a grid**
  - **@ present: 10cm x 10cm x 10cm grid**
  - **Magnetic field service provides B-field at requested *P* position with a linear interpolation using the 8 points on the cube comprising *P***

Requirements

- **Integration of June'05 B mapping in software for DC'06**
  - Last chance to simulate with measured mapping instead of (old) simulation
- **Fast magnetic field service**
  - Crucial for tracking
- **Best possible B-field precision**
  - June'05 mapping gave us a precision of 3.10^{-4}
  - we shouldn't loose it when integrating the data in the software!

MC Simulation

- How well does the simulation agree with the data?
  - differences of 0.1 – 1%? Where?
- How precise do we want/need the simulation to be?
  - Preferably as precise as the measurements
  - How does it reflect in the tracking performance?
- Note: we need anyway the simulation – or some extrapolation/interpolation – in parts where no measurements are possible

Problems at hand

- **Main problem:**

  precision versus efficient/fast/simple B-field service in software

- **B-field map storing format**
  - **@ present: 10cm x 10cm x 10cm grid in field045.cdf file**
  - **Need to ascertain what the grid size needs to be**
  - **Can we still exploit x & y symmetry …?**

- **How to assess the B resolution obtained from the integration of the map measurements in the magnetic field service?**

- **We could/should investigate the impact of grid size & B resolution on the propagation of tracks!**

- **Any other ideas …? Open for discussion …**