# First look at IP6 field maps with a simple Geant4 model

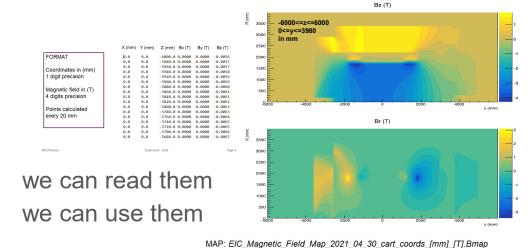
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# Outline

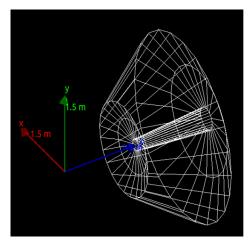
- 1. The field map and Geant4 based RICH geometry
- 2. The effect of the field on the tracks inside the RICH volume.
- 3. Conclusion.

# IP6 field maps

The magnet is being designed **NOW**; Goal of the exercise: Able to provide in semirealtime a feedback concerning the impact on gaseous RICH performance of the proposed designs



The Geant4 model



The Geant4 model used in this exercise everything is air(vacuum)

- world volume
  - box
  - half length (x, y, z) = (4, 4, 6) m

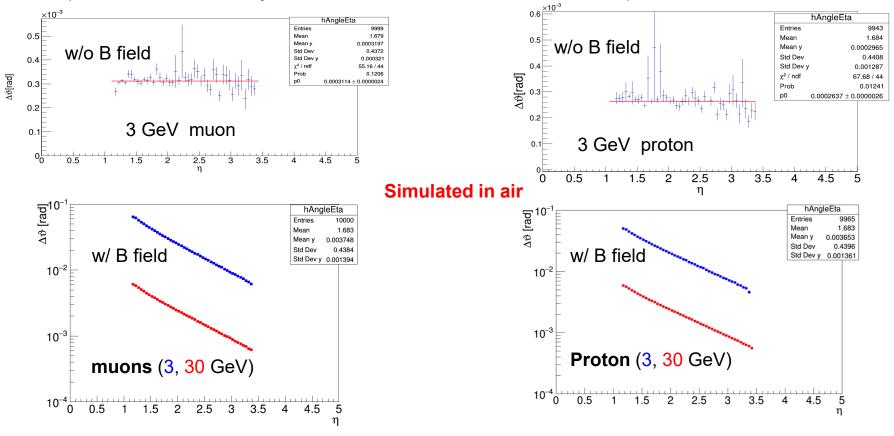
## magnetic field volume

- cylinder
- radius = 4 m, half length = 6 m 0
- B field is read from the IP6 map 0
- radiator volume
  - 0 section of a spherical shell
  - inner radius = 1.5 m, outer radius = 3.0 m 0
  - theta min = atan2(0.1, 1.5), theta max = atan2(2.0, 3.0); 0
  - full azimuth 0
  - B field in this volume is read from IP6 map (can be switch off on demand) 0
  - simulation and analysis strategy
    - fire particles from the IP at (x, y, z) = (0, 0, 0) with different (p, eta, phi) kinematics and PID 0
    - transport them in the geometry (bending in B field, multiple scattering in air, ...) 0
    - record the track information at the entrance and exit of the radiator volume 0
    - measure the angular deviation of the track from entrance to exit of radiator (i.e. cosine between the direction vectors) 0

A similar structure as dRICH

# The effect of the field on the tracks inside the RICH volume.

The plots are for consistency check! Air as radiator and below threshold particles are also considered.



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# Conclusion

- 1. Work program is initiated to simulate the forward RICH for IP6 detector.
- 2. The effect of the magnetic field on the track is under investigation inside the RICH volume.
- 3. Work is ongoing to include available full dRICH simulation and study the effect of magnetic field in terms of separation as a function of momentum.