Muon Shield Plans

Mitesh Patel (Imperial College London)

On behalf of the muon shield group:

H. Dijkstra, T. Ruf (CERN)
Andrey Golutvin, Oliver Lantwin, MP (Imperial College London)
V. Bayliss, T. Bradshaw, M. Courthold, T. Rawlings (RAL)

10th February 2016
Reminder: TP muon shield design

- Engineering aspects of ~48m TP muon shield design calculated with FE model, good agreement with GEANT
  - First look at further details of design: coil shape, material and placement, yoke material (e.g. use of grain-orientated steel → implication for power consumption, cooling)
  - No consideration of support structures [→ scattering], mechanical stress/strain
~35m long warm shield (+conical vessel)

• Simulation side  [HD,TR+student effort]
  – Further optimisation of design; Automate investigation?
  – Consider magnetised hadron absorber

• Investigation of engineering aspects  [Further RAL effort]
  – Engineering items above for modified design
  – Division into sections → coil and yoke manufacture (potentially long-lead time), stepped geometry → feedback into simulation study
  – Consider manufacture and connection between any laminations
  – Refine cost estimate

• Try to optimise gain vs cost, taking into account e.g. hall size
(graded) superconducting proposal

- Investigation of feasibility  [RAL, contacted Novosibirsk]
  - Consideration of proposed setup – return field, coil design
  - Make first magnetic model
  - Evaluation of cost
  - Refine quench calculation

- Simulation side
  - Further optimisation of design

- Again, try to optimise gain vs cost