Muon Shield Intro

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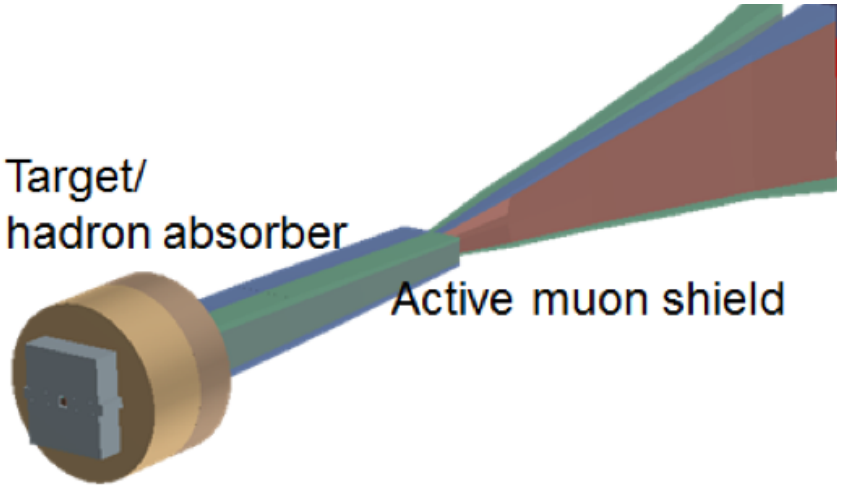
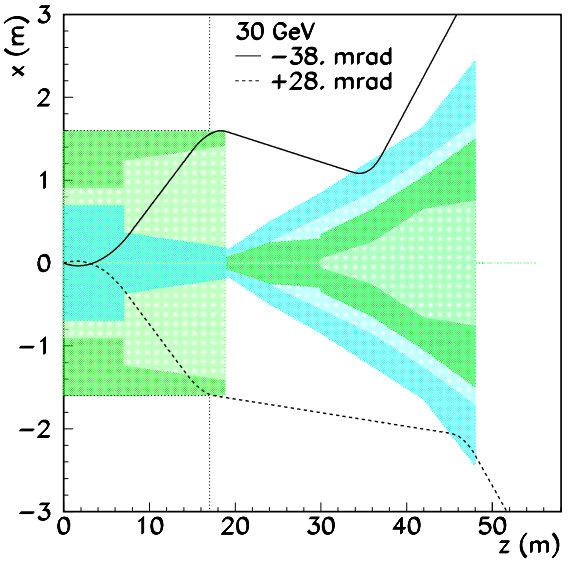
Introduction

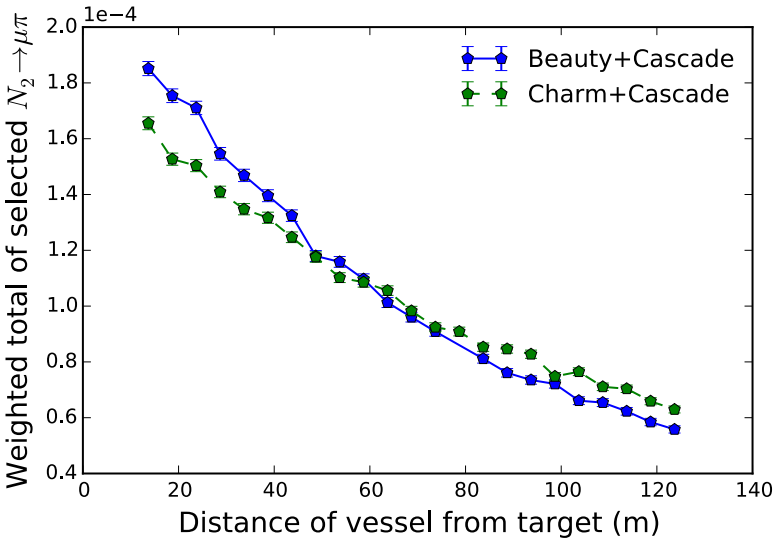
- SPS beam will produce >10^{10} μ / spill
- Active muon shield required to sweep μ with p<350 GeV/c out of the detector acceptance
- After TP, ~48m long active shield designed (by-hand), field calculated with full FE model, good agreement with GEANT

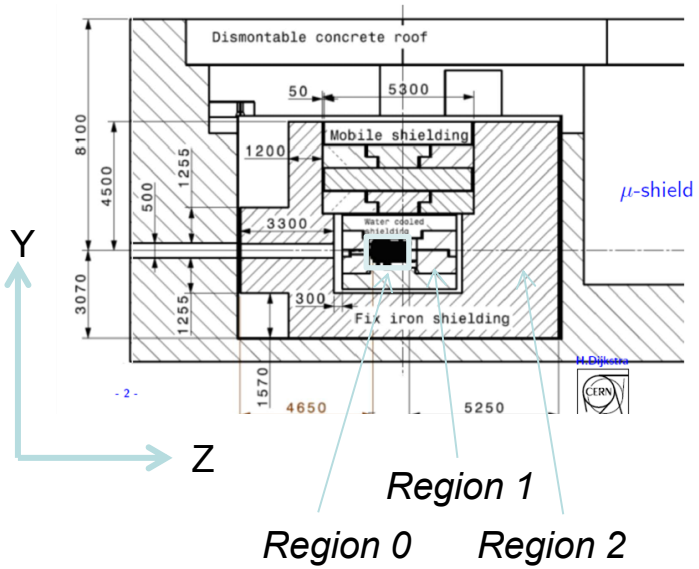




Effect of the hadron stopper

- Detector acceptance strong function of the shield length
- Muon shield starts after ~5m of proximity shielding downstream of the target which acts as a hadron stopper
- First magnets of muon shield then have a large aperture, require larger system downstream





Magnetising the hadron stopper

- Shield design automated (minimisation in 2d, studies being upgraded to 3d) – need to refine criteria used
- Have studied the effect of magnetising the hadron stopper
  - Can shorten the muon shield and reduce the amount of iron by a factor ~2
  - Substantial gain in acceptance for e.g. HNL
- First look at engineering aspects of magnets required in shielding and target region, discussion with CERN experts
- Implement an educated guess of an achievable configuration to allow the rest of SHiP to start adapting, refine design and engineering of shield separately