

MICE STEP IV with reduced Focus Coil currents - update

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Introduction

Operation of Focus Coil #1 in Step IV of MICE

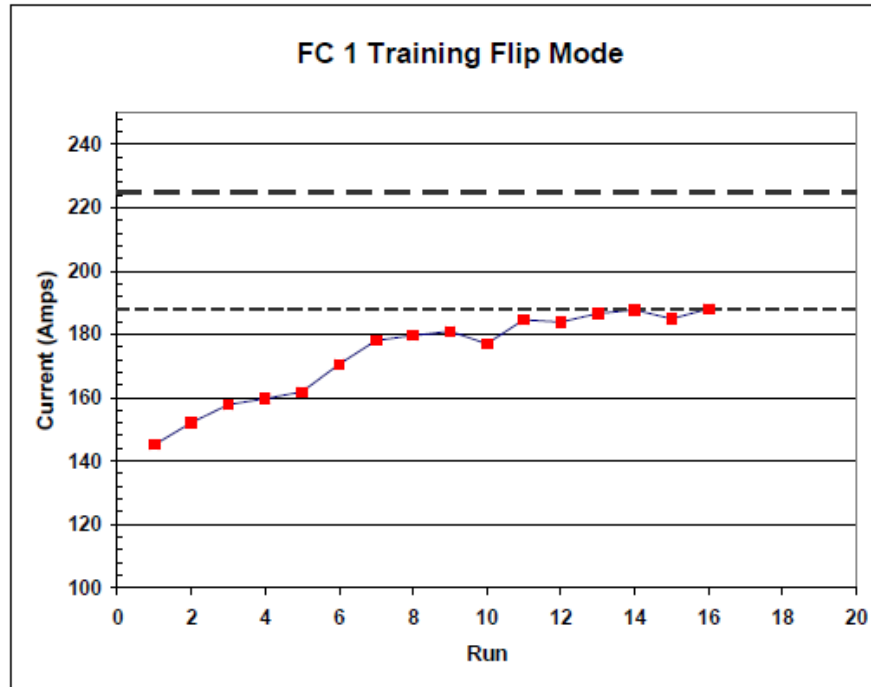


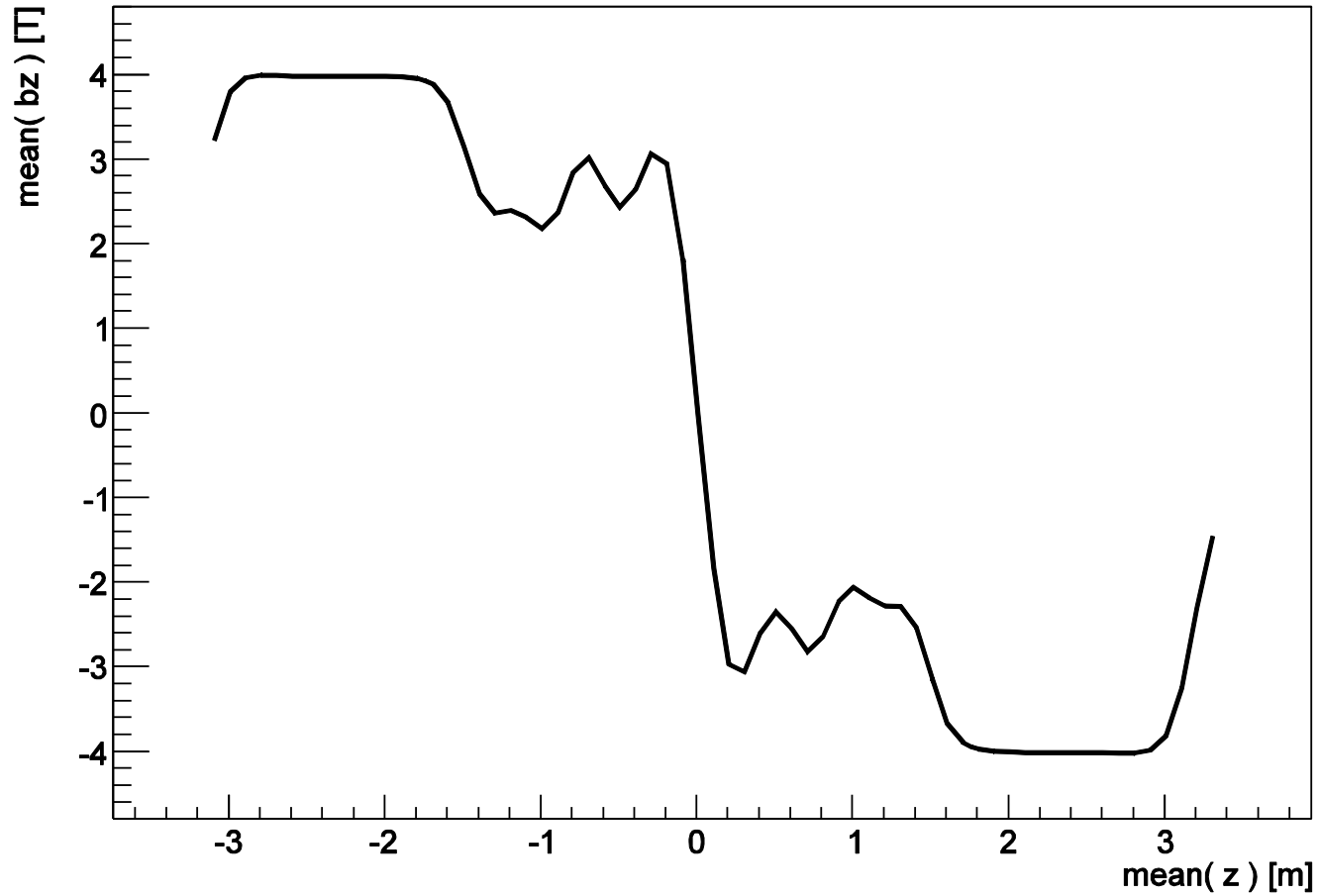
Figure 1: Training curve for FC#1 in flip mode (2103 runs)

- Focus Coil 1 was trained to the nominal operating point of 188 A (200 MeV/c, flip mode, beta=42 cm), but... It is not demonstrated to be stable at this point yet!
- In the real MICE channel at STEP iv configuration we expect magnetic coupling between magnets, which may likely result in the necessity to reduce the FC current for stable operation.

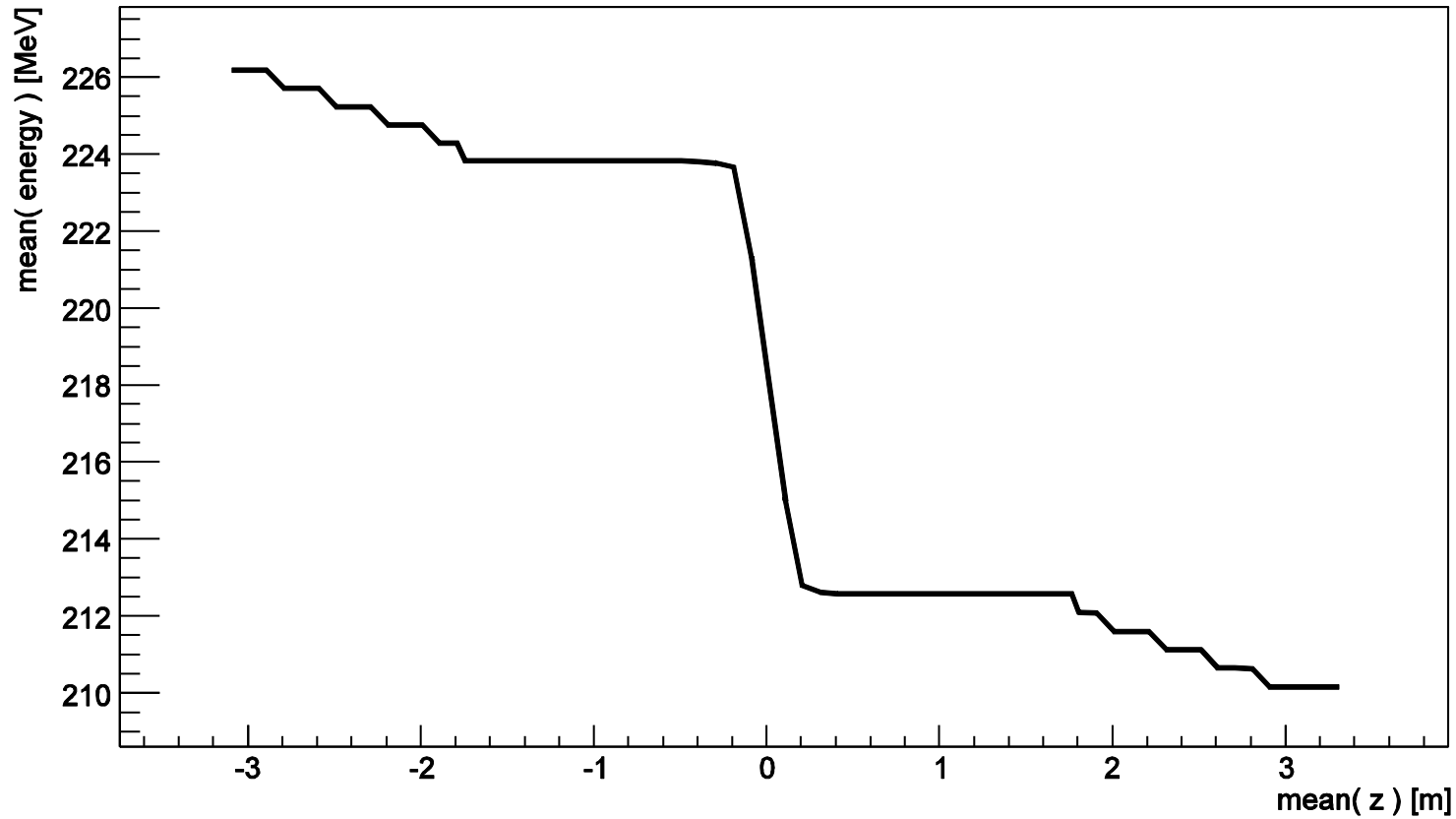
Introduction (2)

- We used J. Cobb's prediction as in his talk in Napa.
- MAUS software was used for tracking studies.
- Matched solution was found with symmetric and asymmetric M1 and M2 coils configurations.
- Gaussian distribution is used as the input beam with various parameters.
- Beam momentum was set to 200 MeV/c.
- Tracking Reconstruction was compared with MC results.
- Big effort was devoted to upgrade MAUS geometry description to realistic "as built" one.

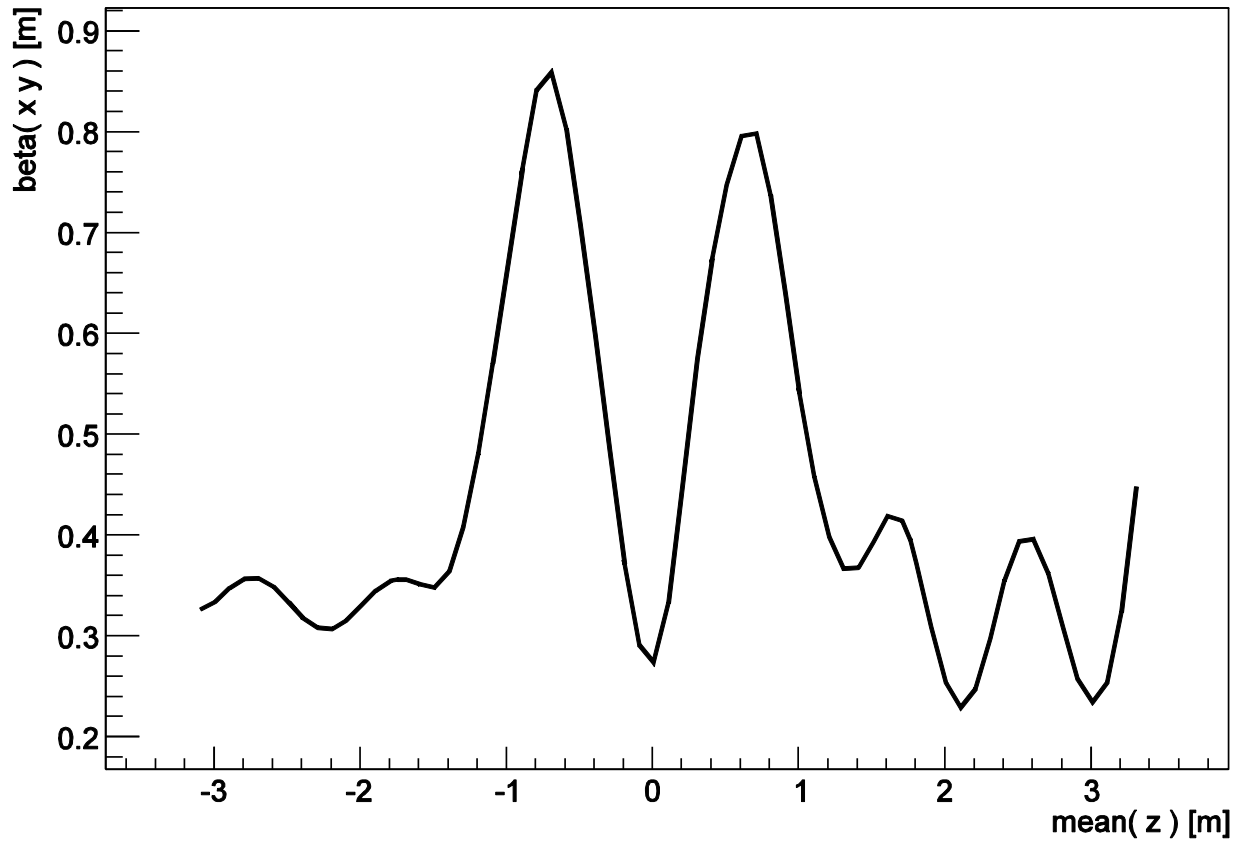
Asymmetric case, B



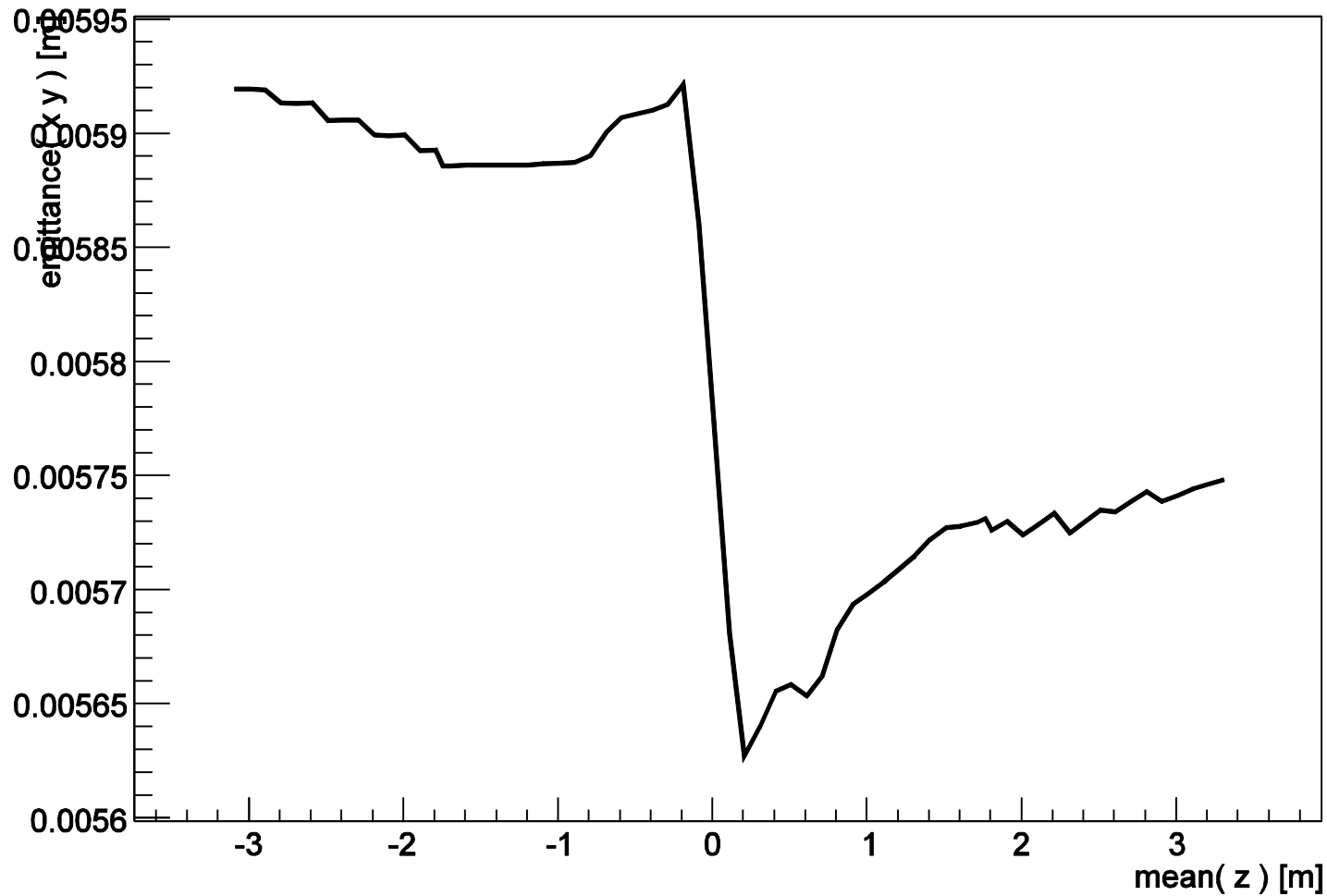
Asymmetric case, energy



Asymmetric case, beta



Asymmetric case, emittance



Summary of results so far...

- Assuming reduced current still **2.6 % emittance reduction** was seen in MC studies.
- We used RMS momentum spread of 5 MeV (1 sigma) and 6 mm emittance.
- The Tracker Reconstruction was used and some small discrepancies were found with comparison to MC.
- **We are working on it!**