

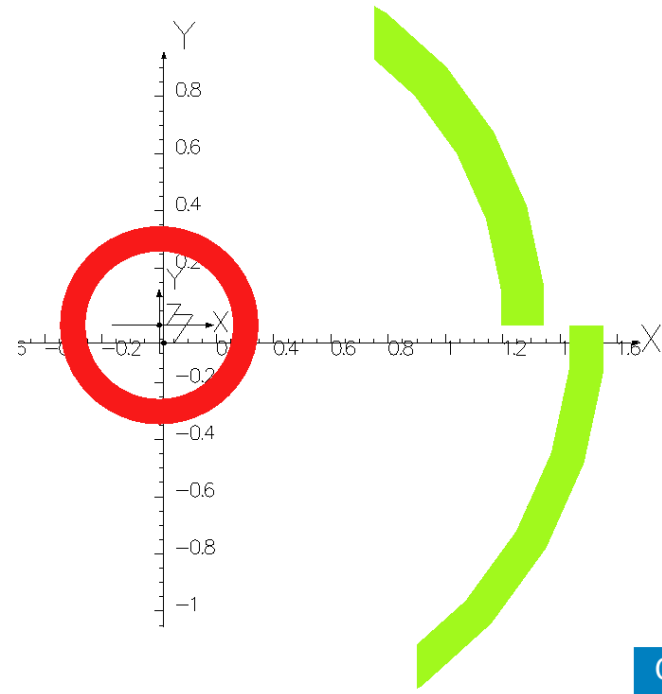
Update on Shield

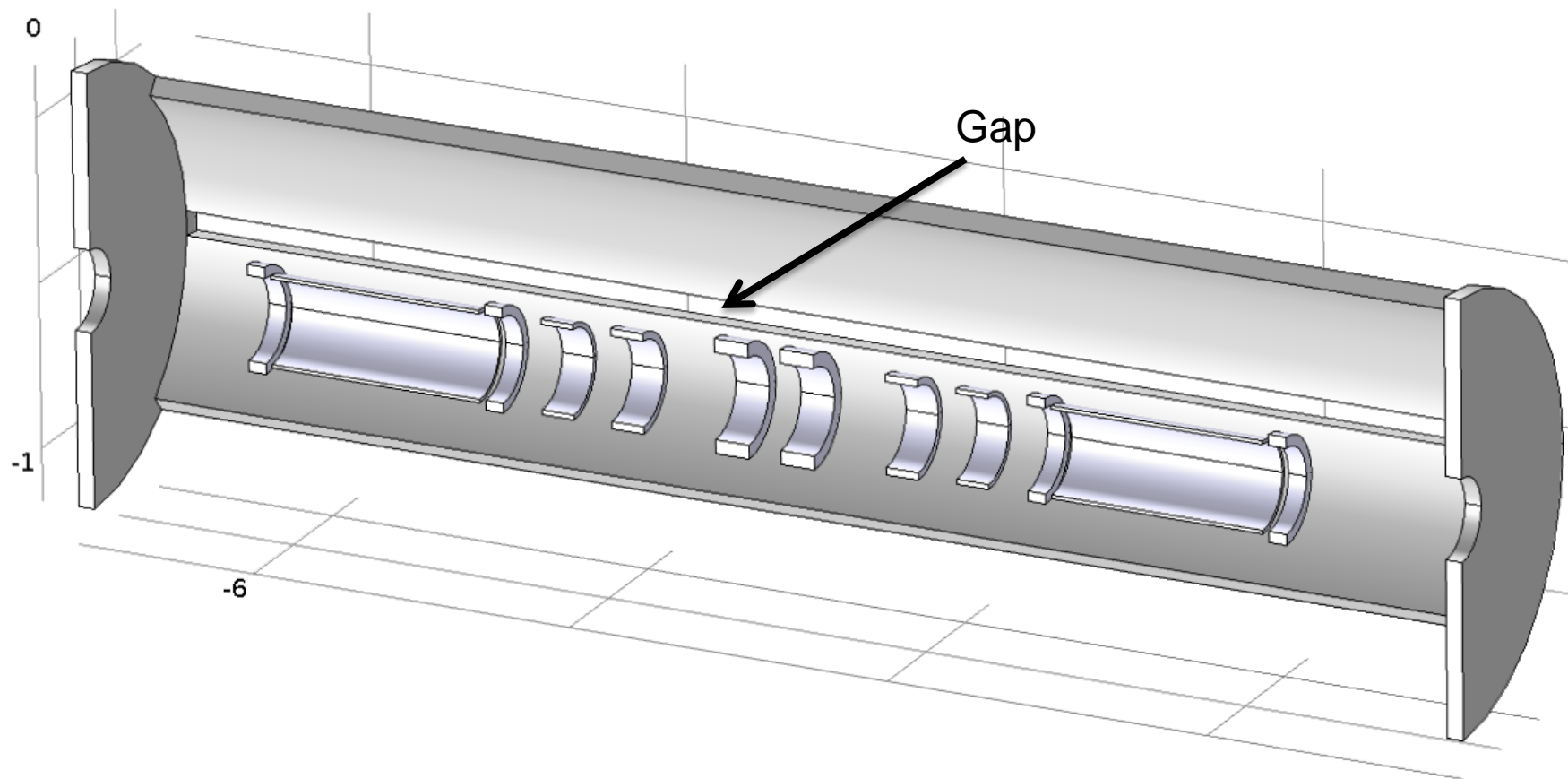
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Brookhaven National Laboratory
Advanced Accelerator Group

- Gaps in shield
- Field in ISIS plant room

Gap Study

- Previous study showed that a longitudinal gap of 5 mm does not affect shielding performance
 - (engineering: joints)
- Study: what is the limit on this?
 - Tracker!

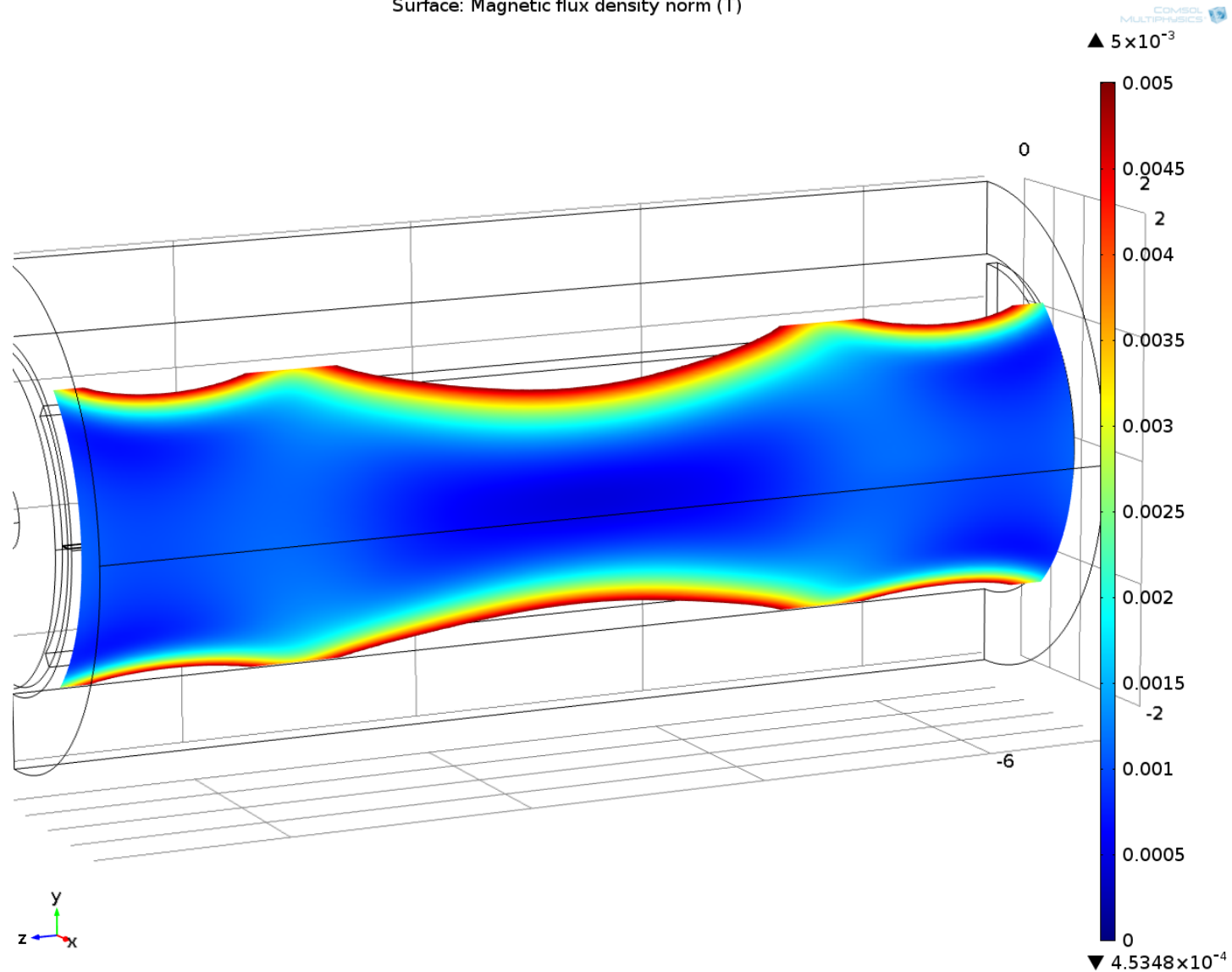




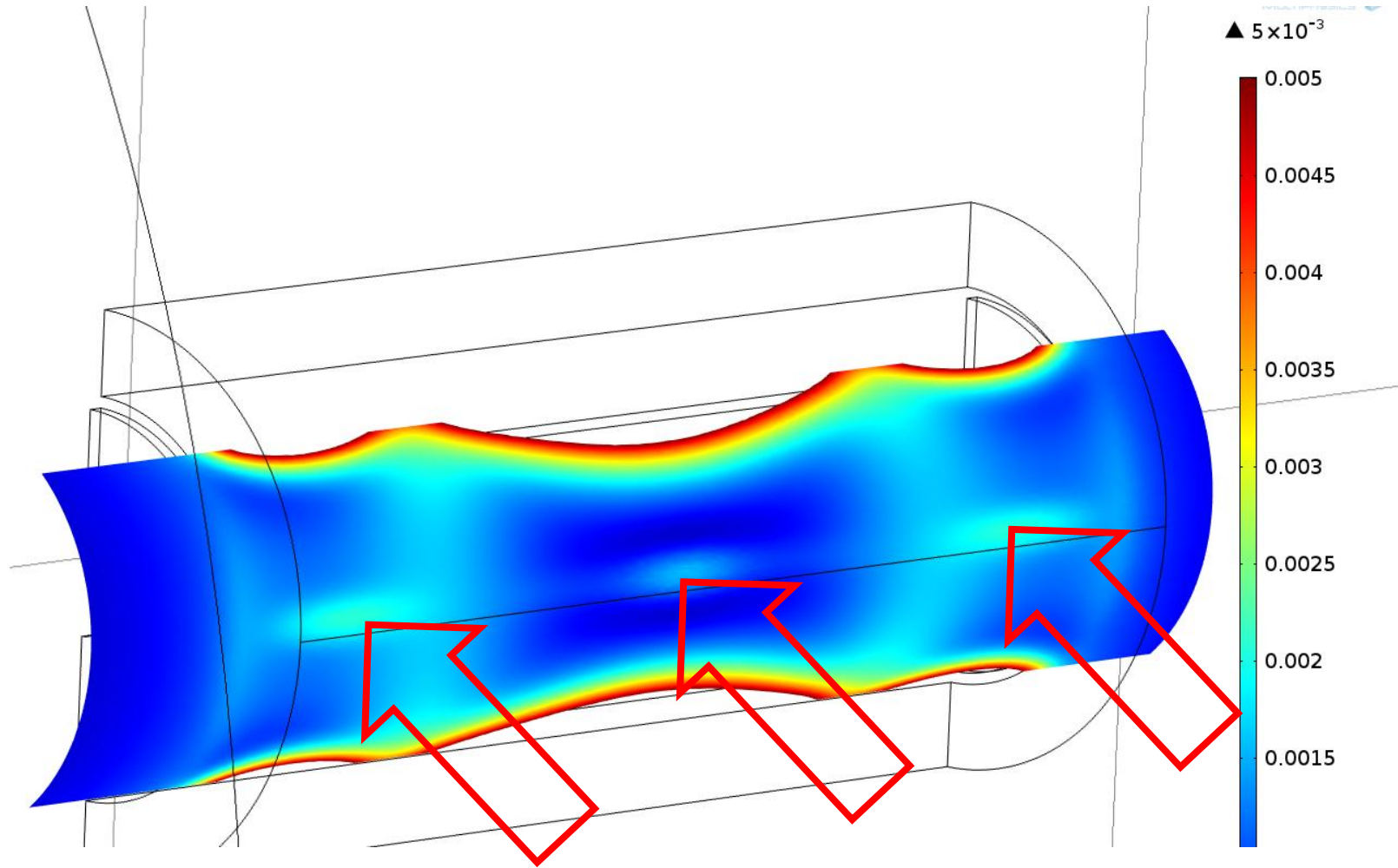
MICE Step IV, 200 MeV, Flip Mode
Virostek plates connected to shield
Shield thickness: 12 cm

5 mm Gap

Surface: Magnetic flux density norm (T)

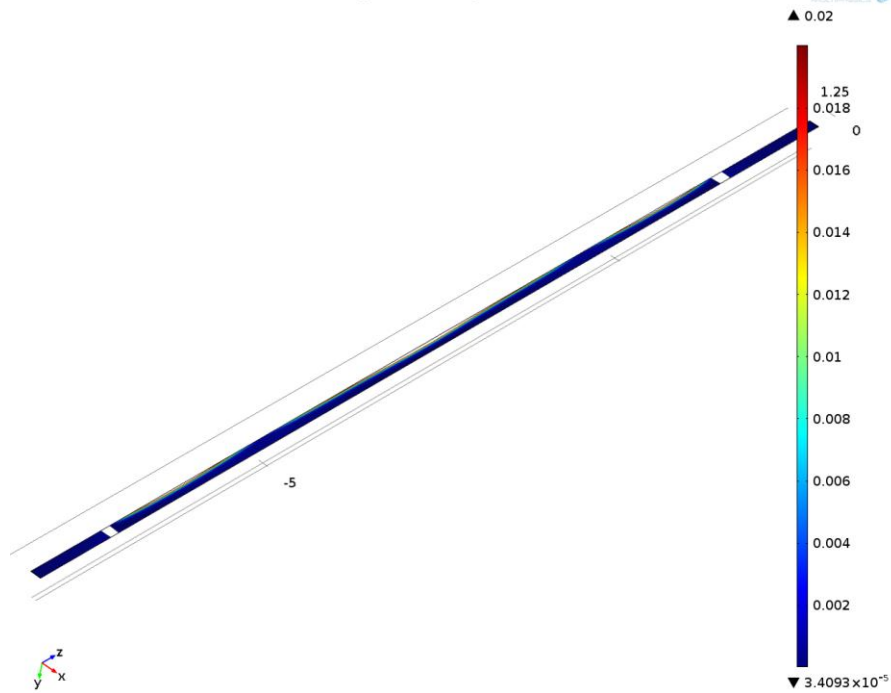


200 mm Gap



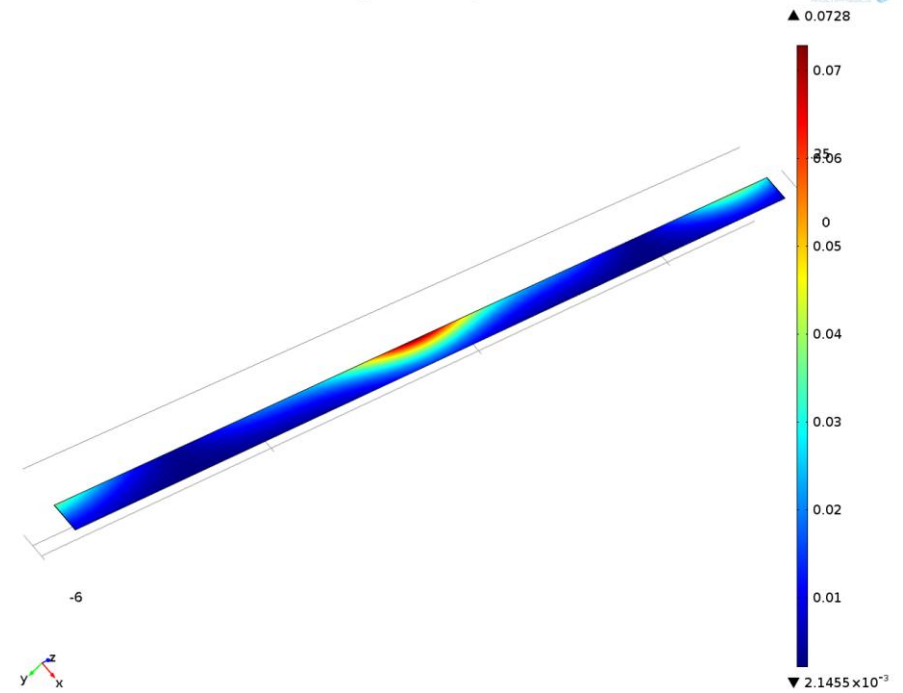
Field in Gap

Surface: Magnetic flux density norm (T)



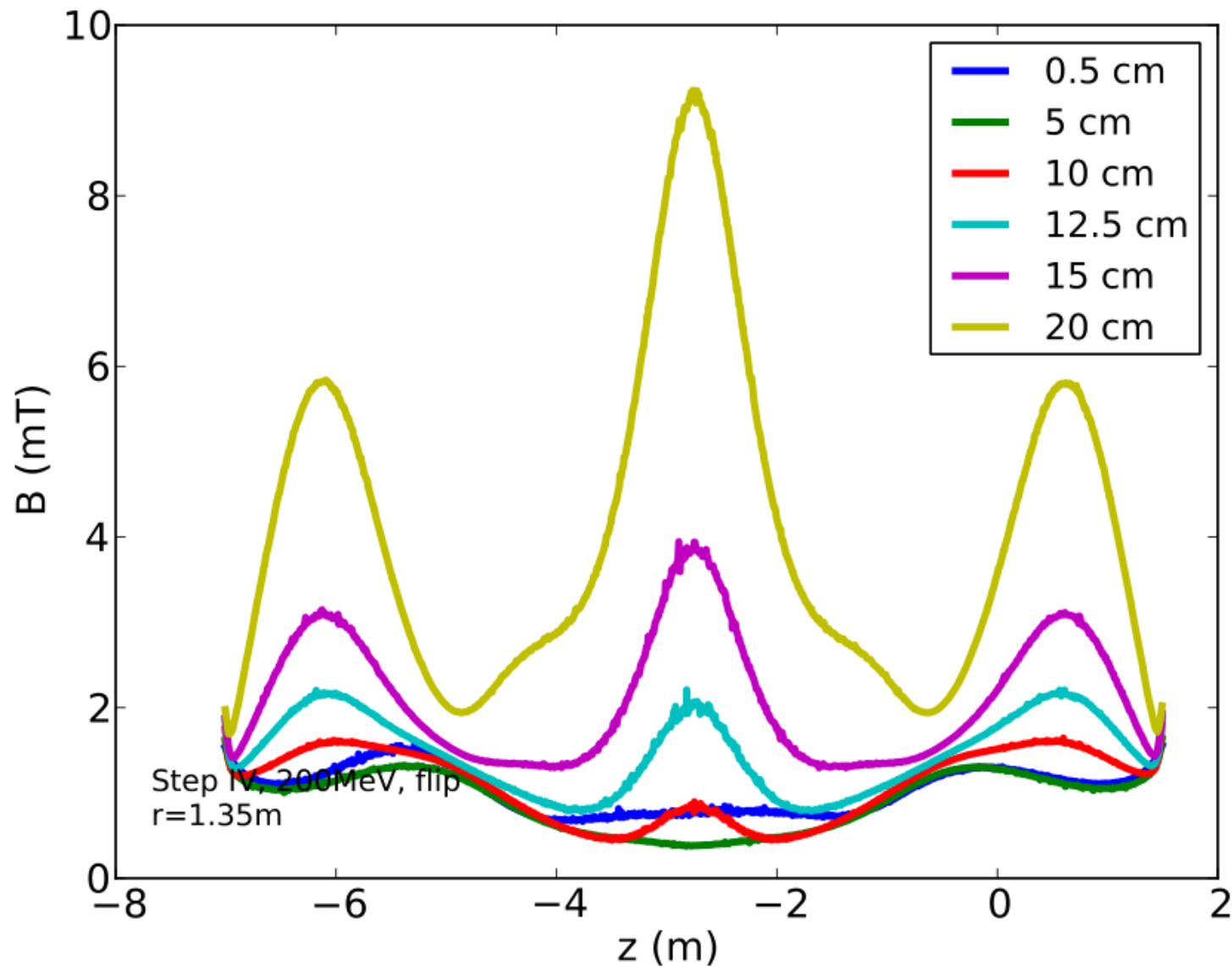
50 mm

Surface: Magnetic flux density norm (T)

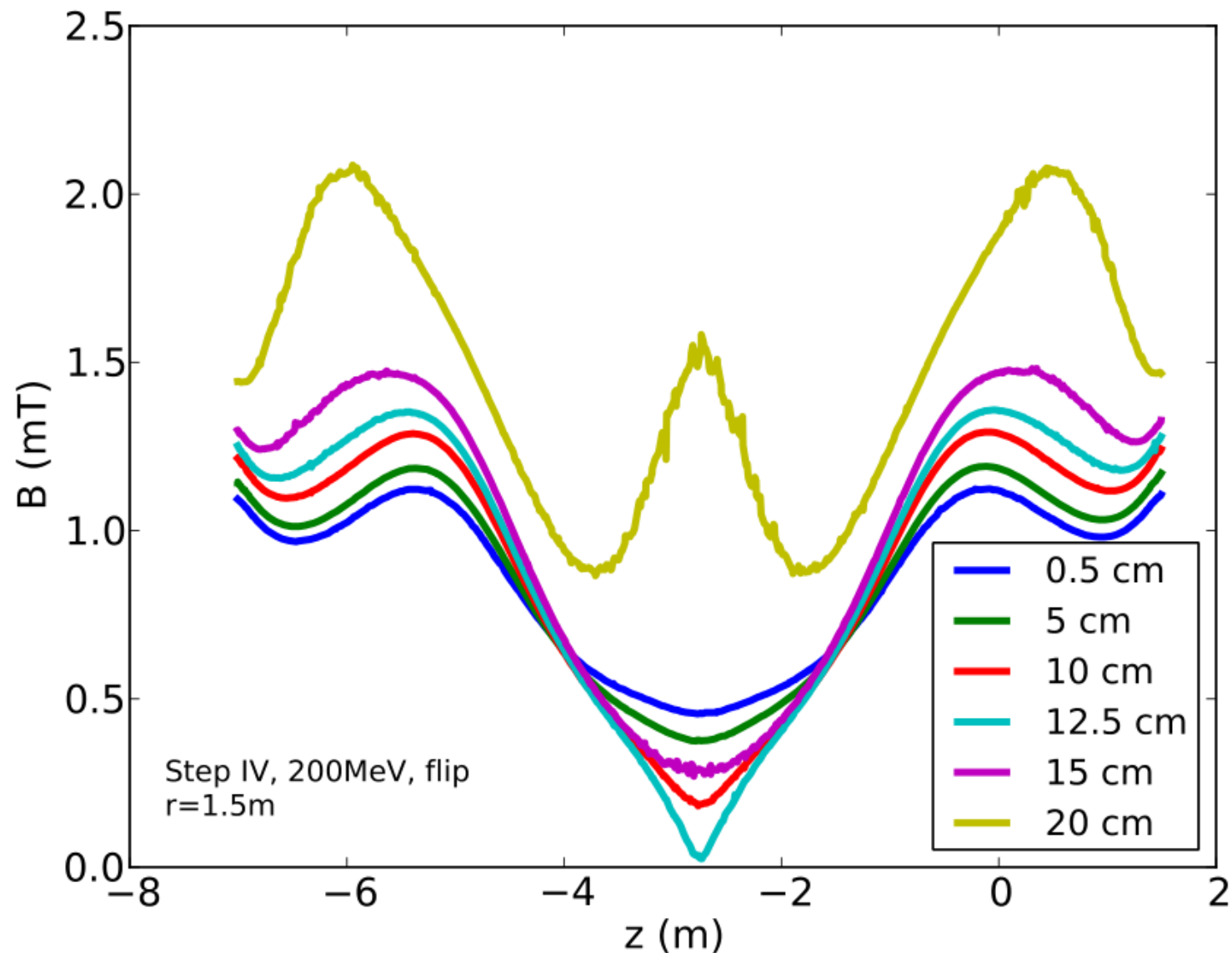


200 mm

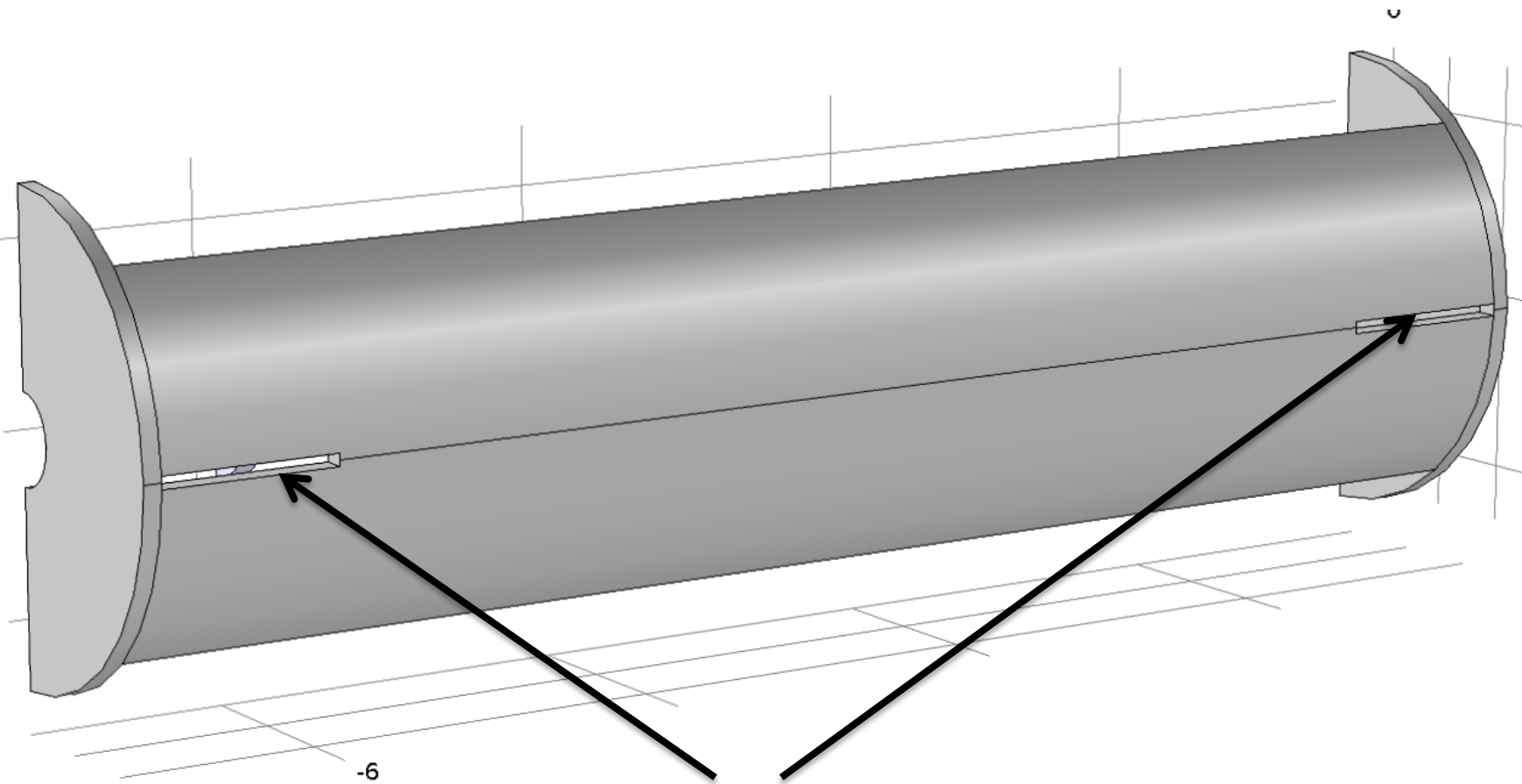
Field in Gap



Field Behind Shield



A Possible Geometry?



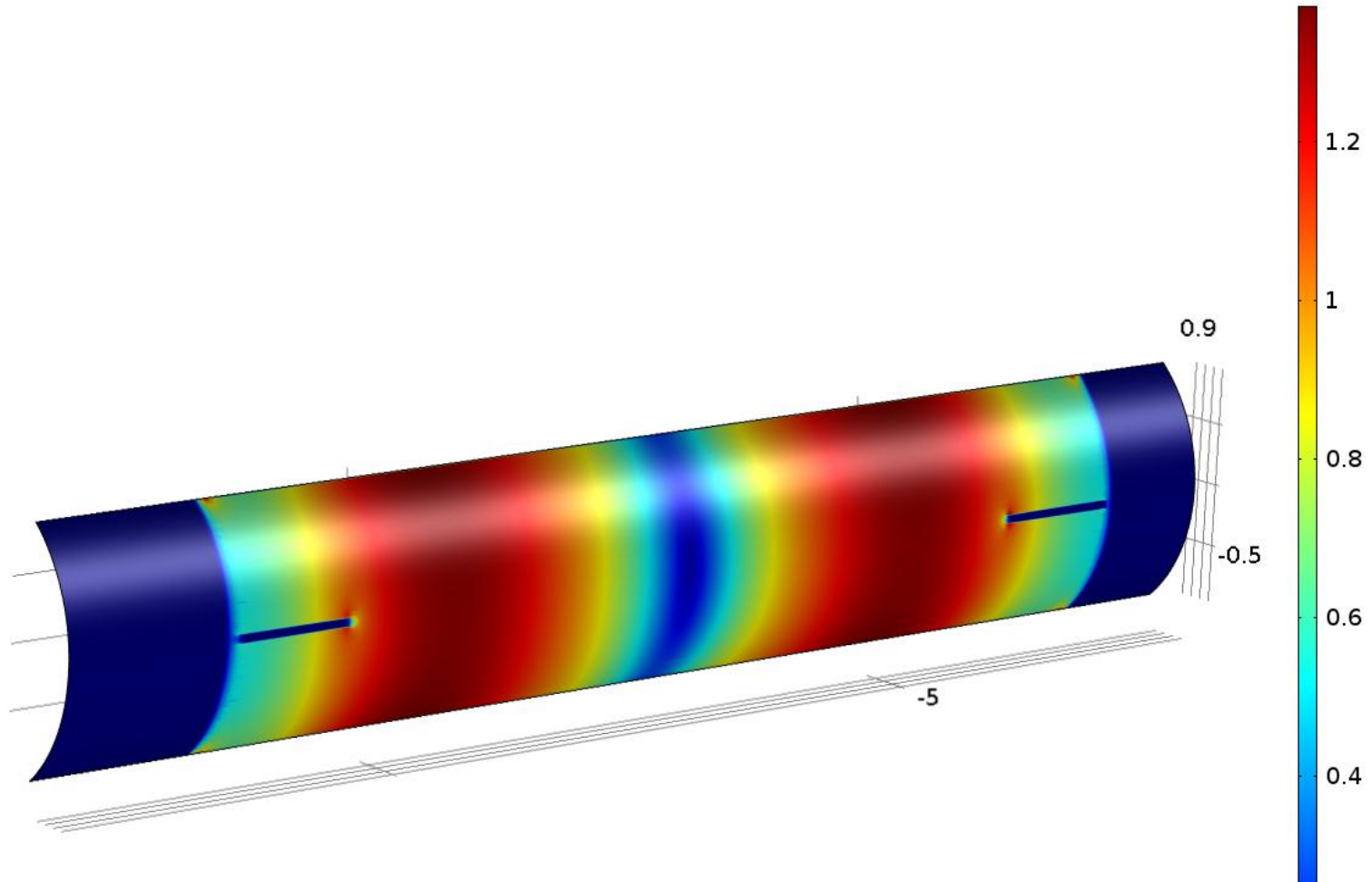
Gaps: 1 m long, 10 cm wide

Magnetization Shield

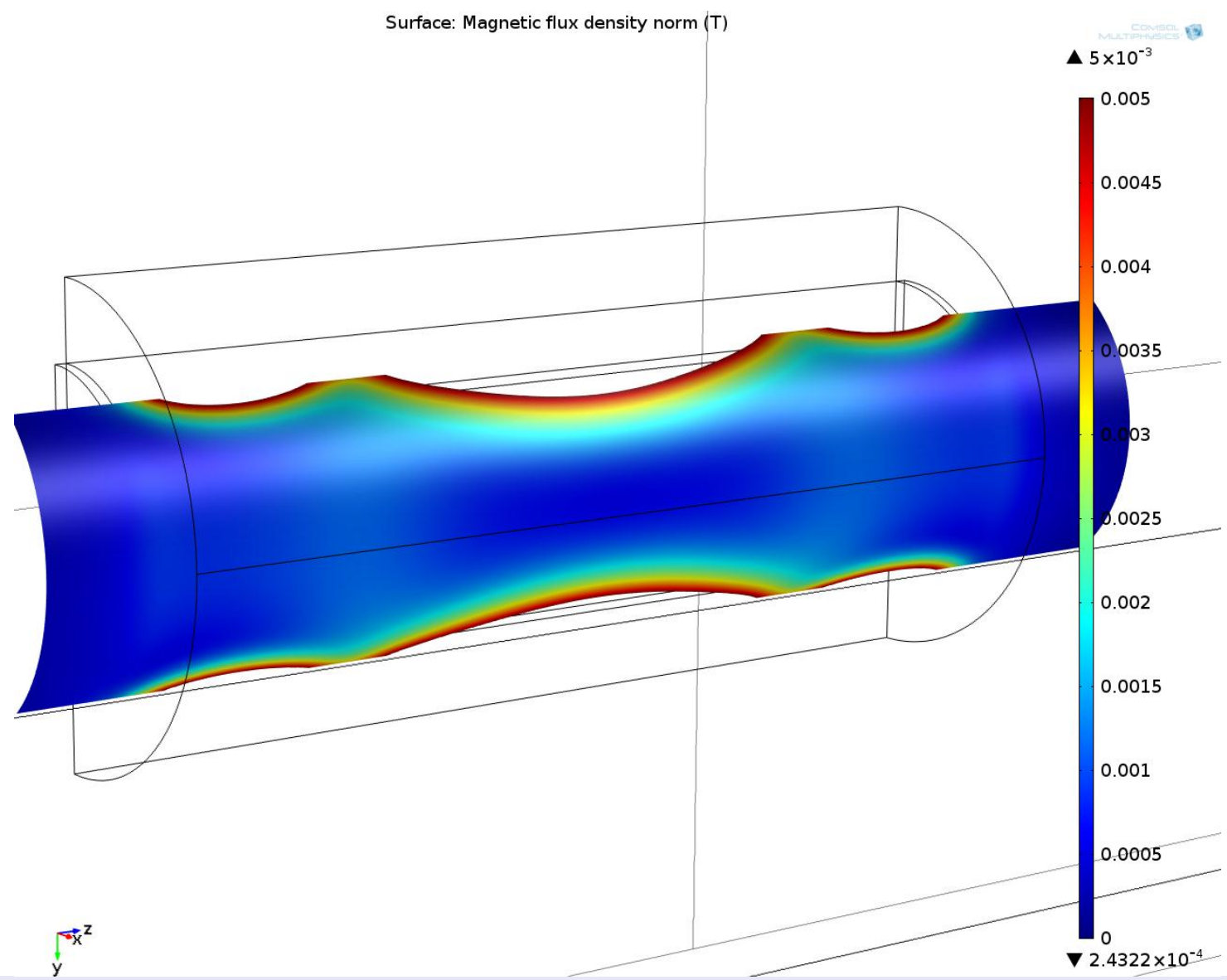
Surface: Magnetic flux density norm (T)

COMSOL
MULTIPHYSICS

▲ 1.3696



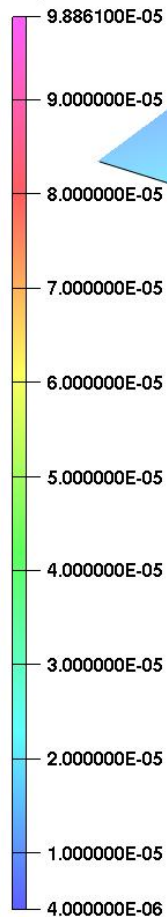
Field $r=1.5\text{m}$



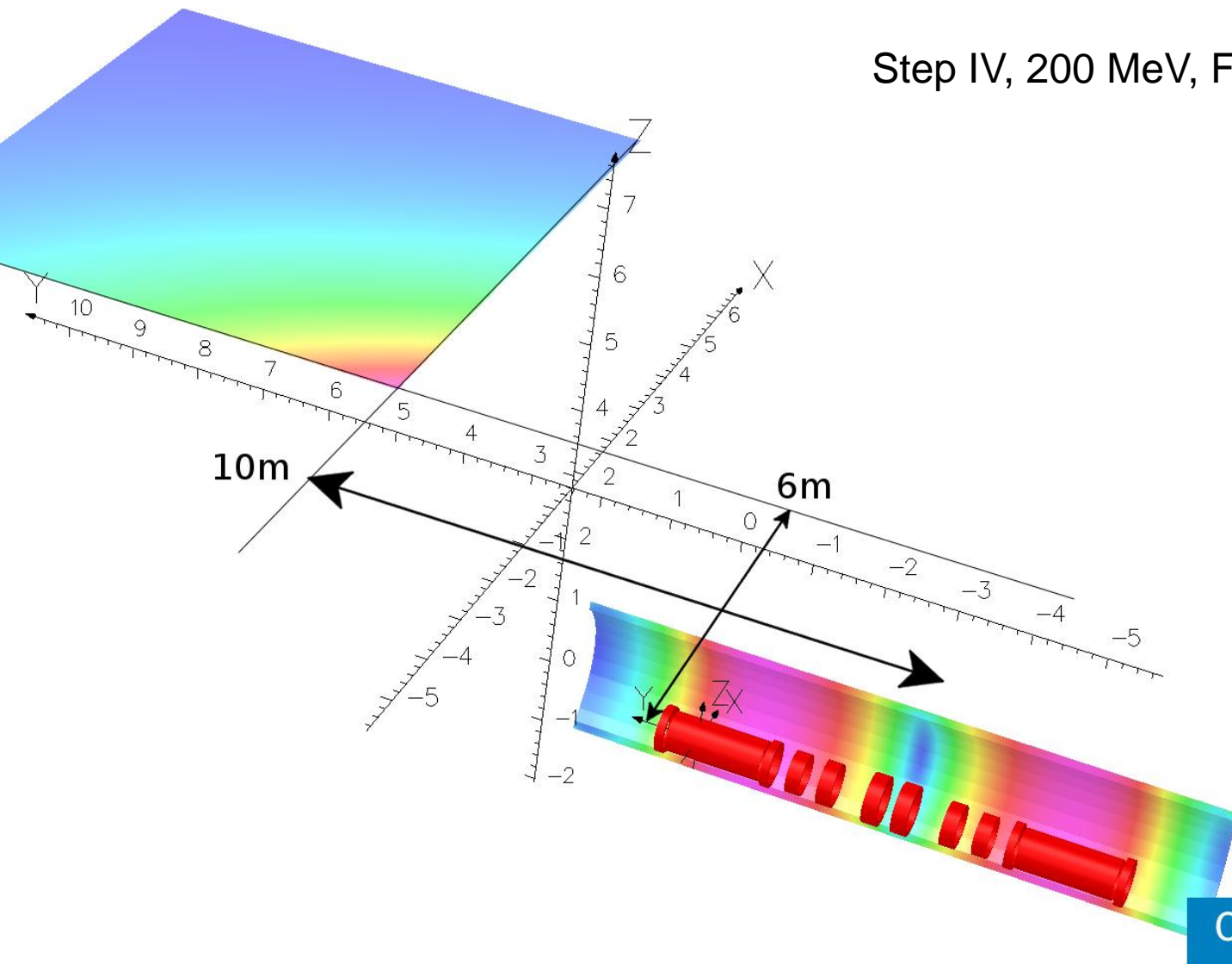
Field in ISIS Plant Room

26/Nov/2012 18:16:46

Map contours: BMOD



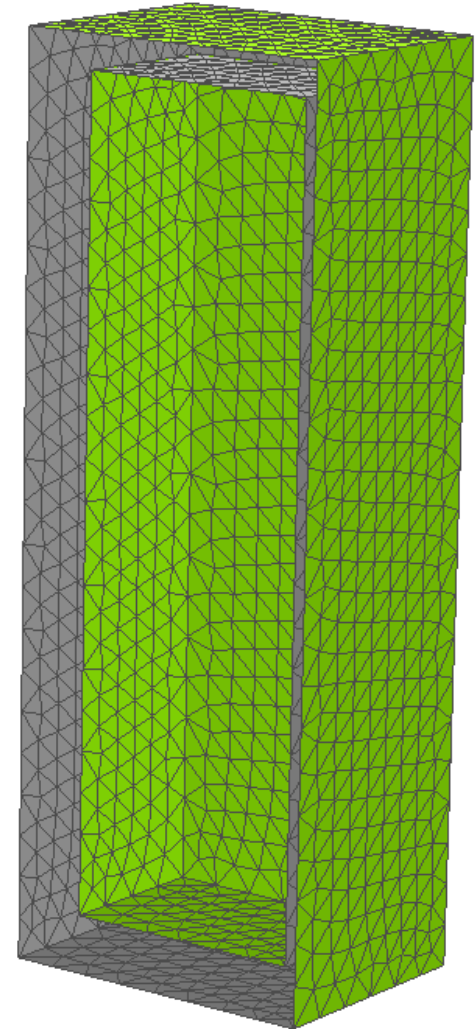
Integral = 1.674582E-03



Step IV, 200 MeV, Flip



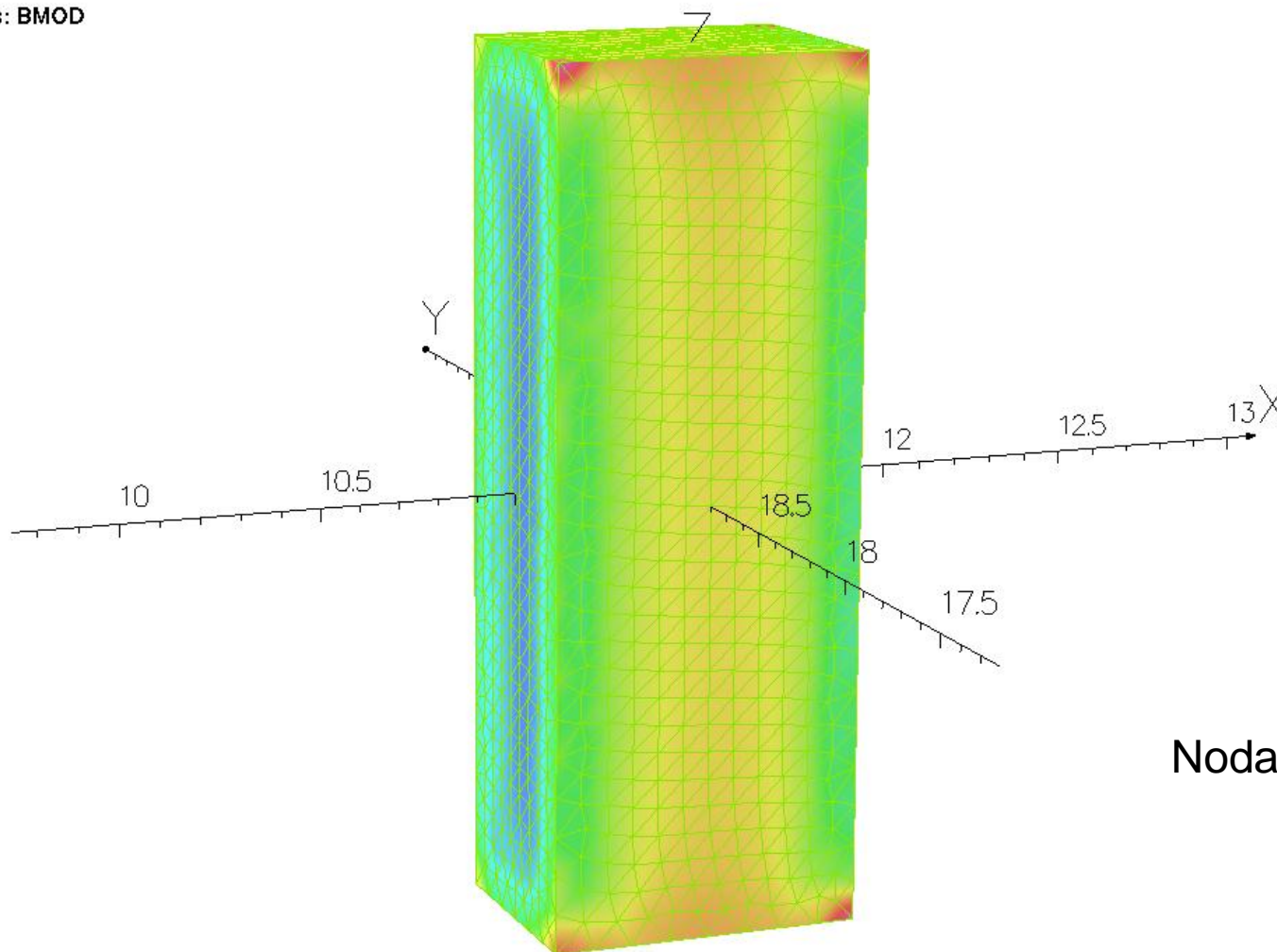
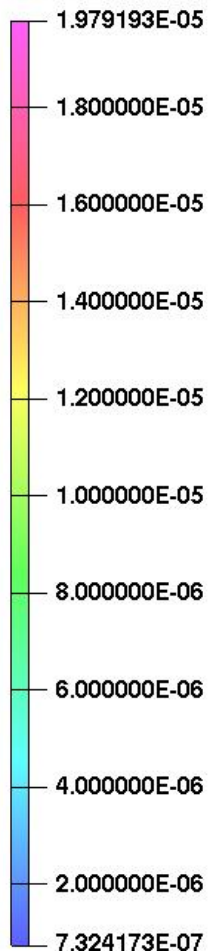
- Single rack in middle of plant room
 - Dimensions:
600x800x2200
 - $t=10\text{cm}$
 - Material: AISI 1010



Magnetization

27/Nov/2012 16:11:15

Surface contours: BMOD

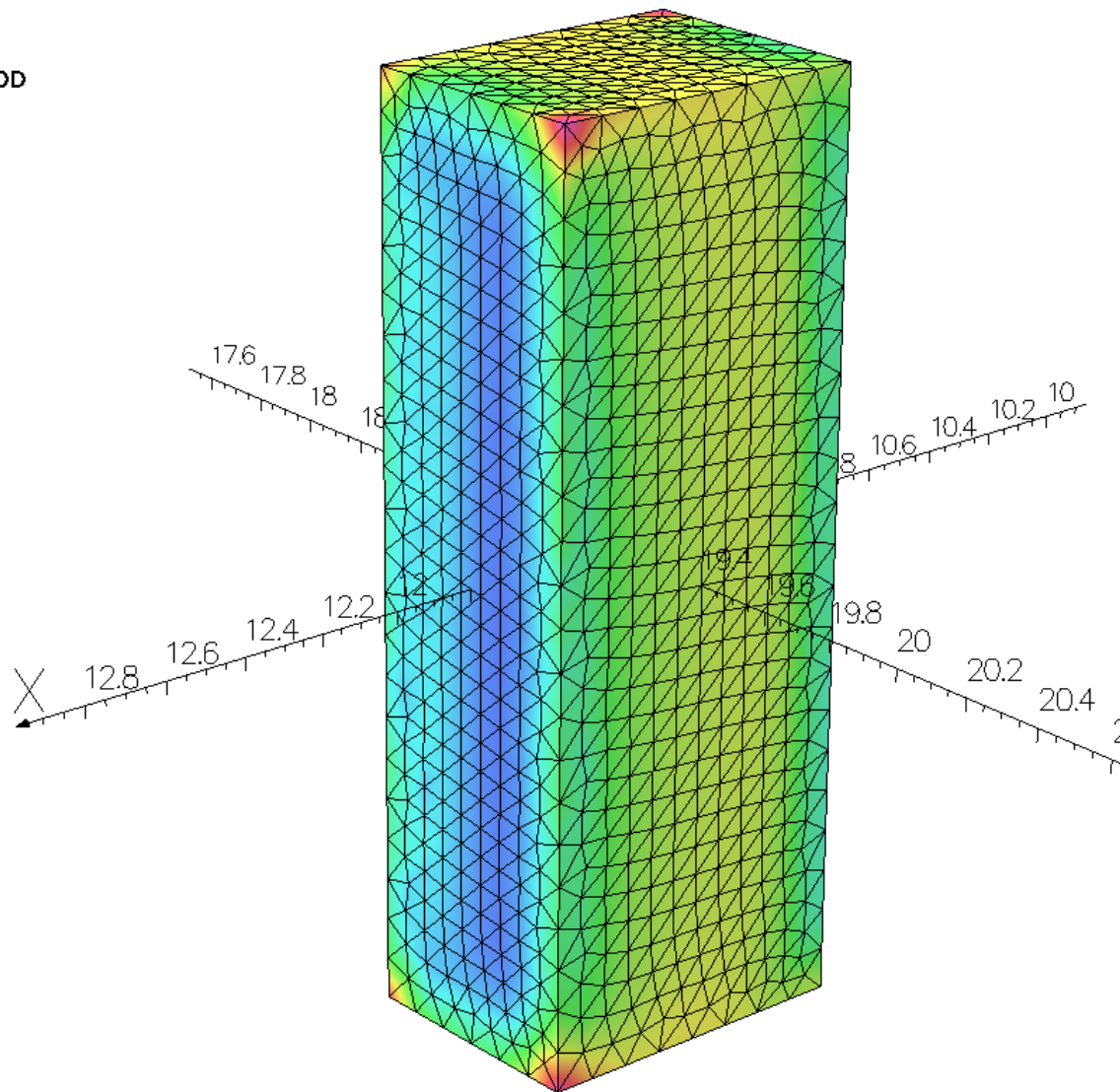
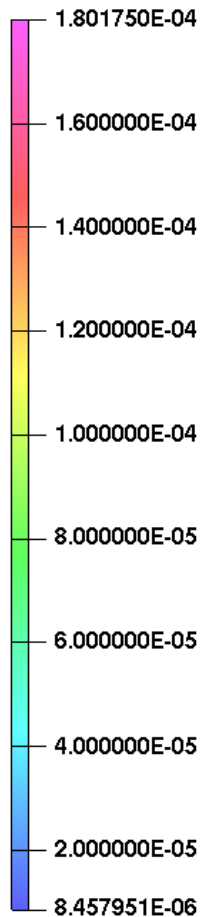


Nodal field

Magnetization – No Shield

27/Nov/2012 18:15:37

Surface contours: BMOD



Nodal field

Field in Rack

27/Nov/2012 16:15:20

Map contours: BMOD

4.609996E-06

4.500000E-06

4.400000E-06

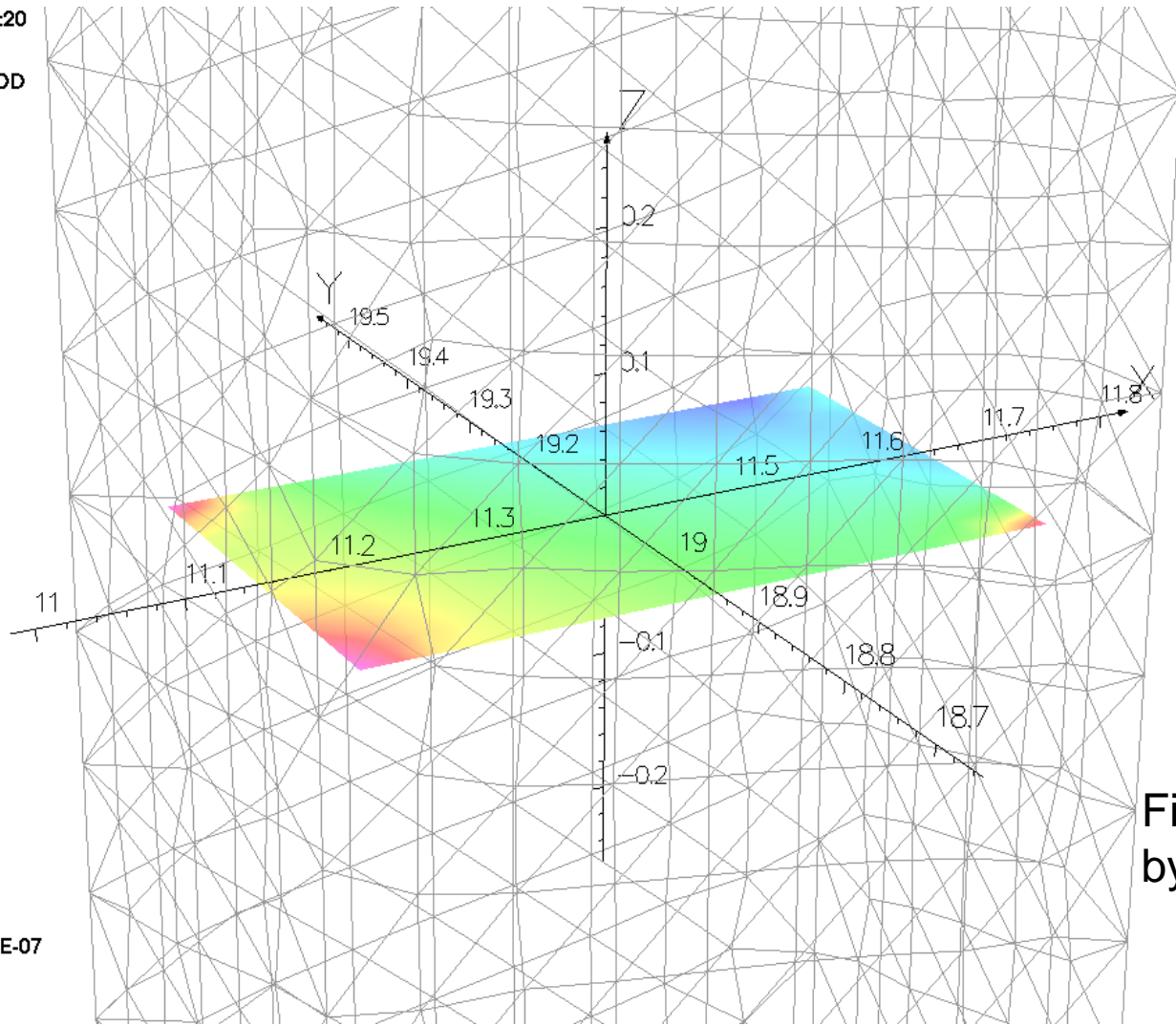
4.300000E-06

4.200000E-06

4.100000E-06

3.978470E-06

Integral = 6.318582E-07



Field evaluated
by integration

- Gaps in shield
 - Simulations indicate gaps 10-15cm possible without performance impact
 - Sufficient as feed-through for tracker fibres?
- ISIS plant room
 - so far return yoke seems to lower field in plant room effectively