

ICOOOL & G4beamline comparison, MICE new reference lattice

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Parameters

- Aperture = 250 mm
- FC current = 40 A/mm²
- M1 current = 123.04 A/mm²
- M2 current = 113.12 A/mm²
- Transverse emittance = 6 mm
- Transverse beta = 333 mm
- No energy spread
- Beam starts at the center of 4 T plateau (z = -4050 mm)
- Sigma_x = 32 mm, sigma_px = 20 MeV/c
- P_avg = 200 MeV/c
- Absorber: LiH, density 0.693 g/cm³, length = 65 mm
- RF: V_{max} = 16 MV/m, phase = 90°, f = 201.25 MHz

Covariance matrix

- Chris suggested:

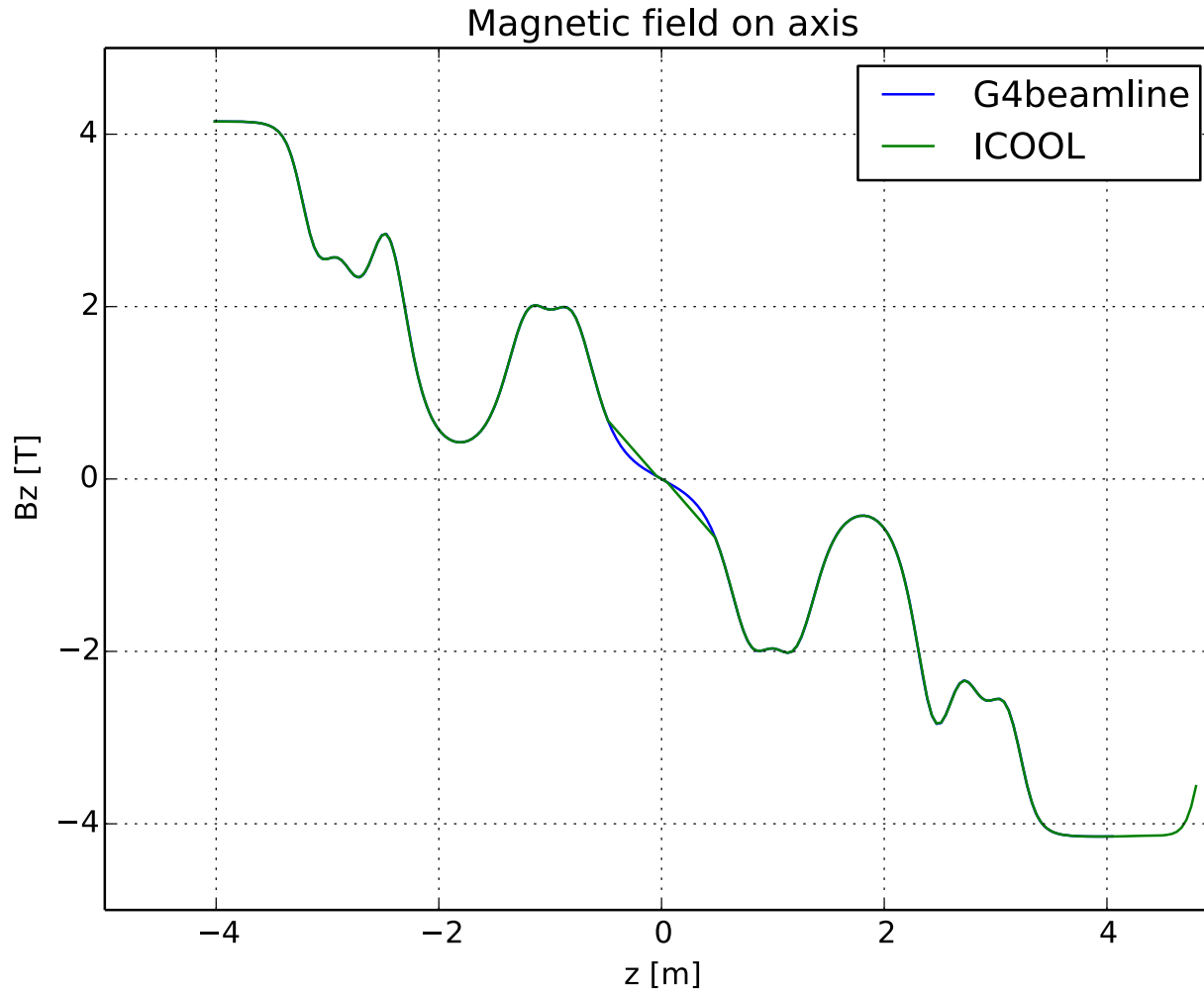
```
[[ 1055.52342   -0.         0.        -632.87592112]
 [  -0.         760.21240555  632.87592112   0.        ]
 [   0.         632.87592112 1055.52342   -0.        ]
 [-632.87592112  0.         -0.         760.21240555]]
```

- I get from ICOOL:

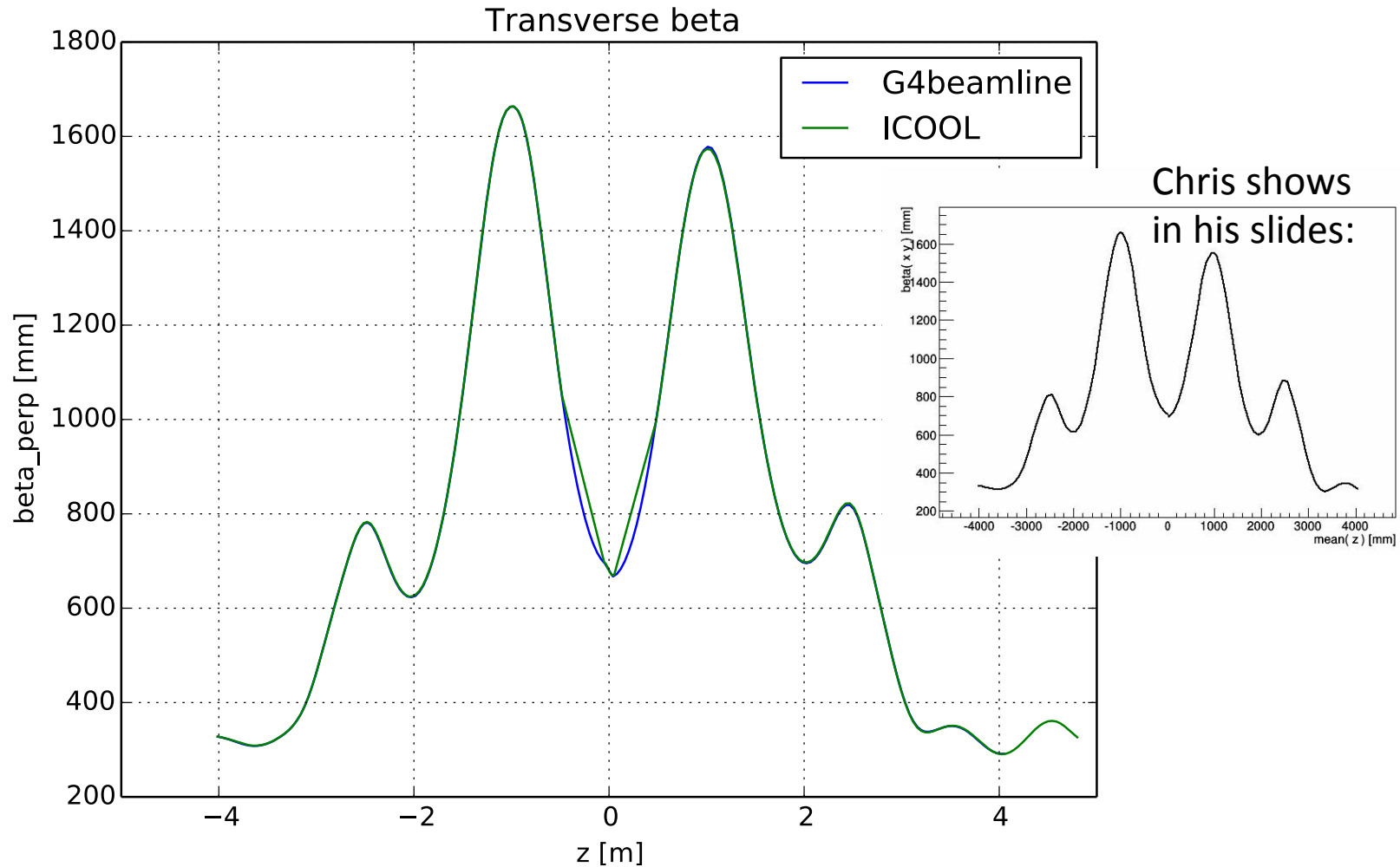
```
[[ 1051.21661294,  1.82299623, -4.52089131, -630.58126768],
 [  1.82299623,  766.63386673,  633.76973798, -1.80311142],
 [ -4.52089131,  633.76973798, 1049.74694963,  2.04269374],
 [-630.58126768, -1.80311142,  2.04269374,  760.04961222]]
```

- Good enough?

Magnetic field on axis

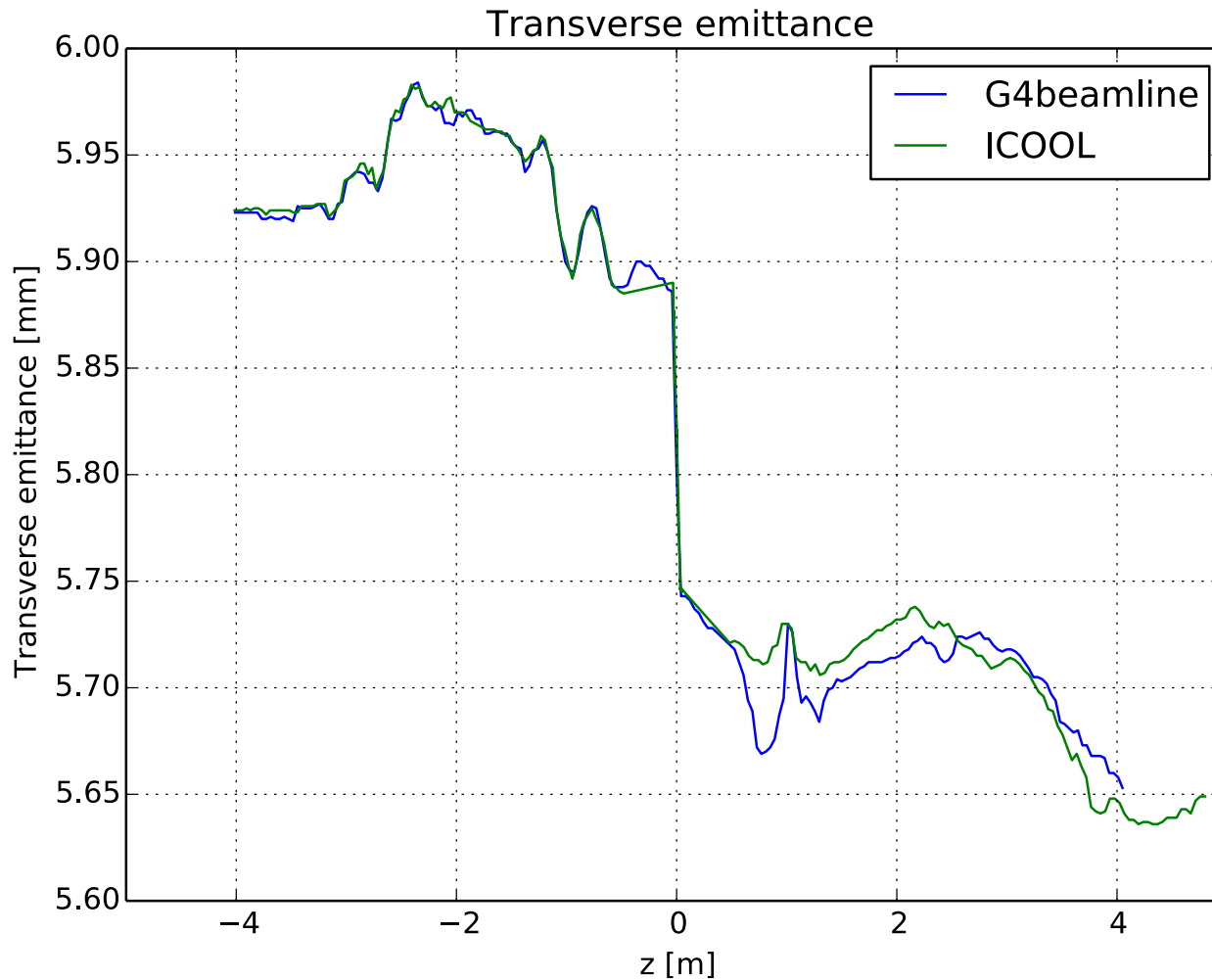


Transverse beta



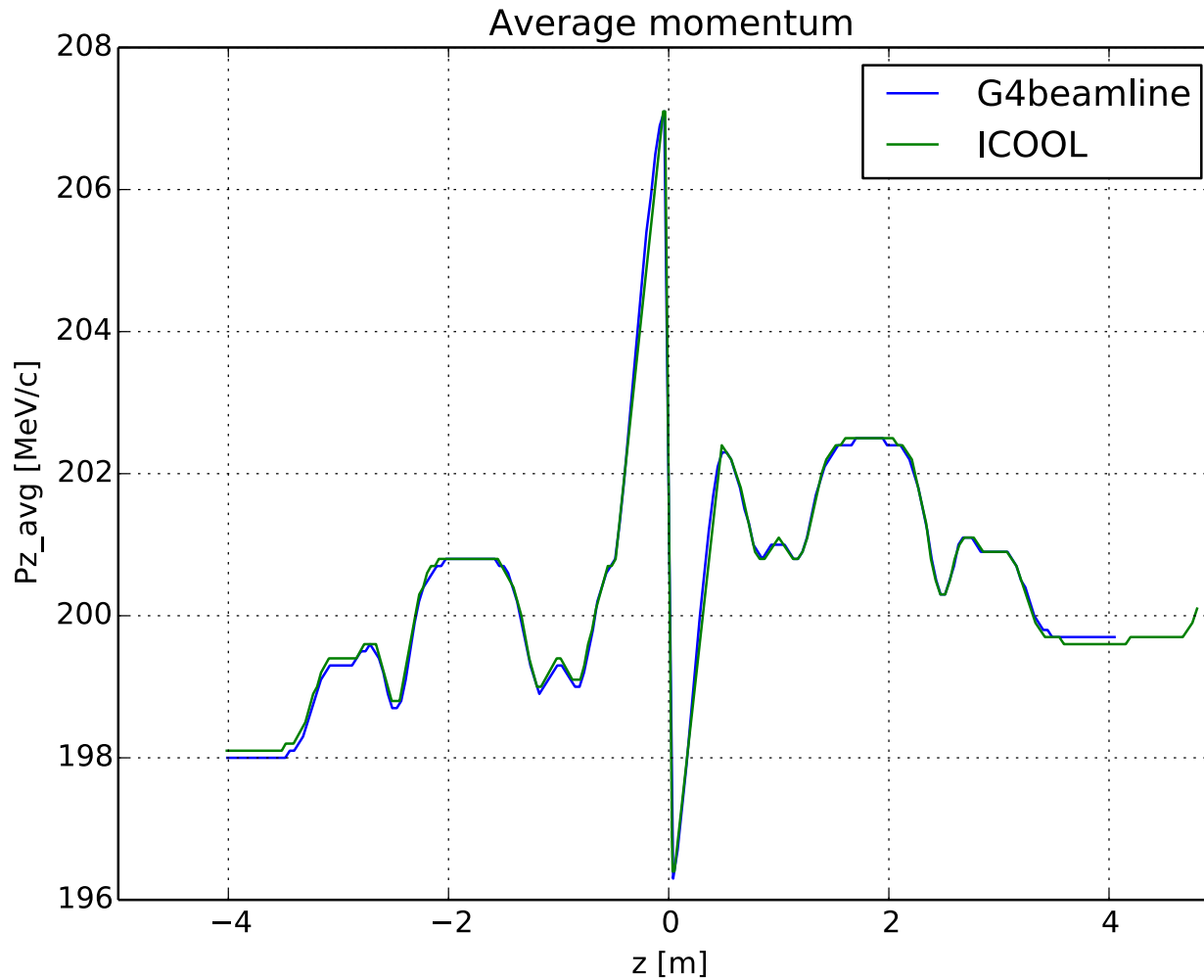
ICOOL does not have points inside the RF, hence the difference

Transverse emittance



4% emittance reduction

Average momentum



Some acceleration due to LiH density used (0.693 g/cm^3)

Transmission

