

Settings with M2D

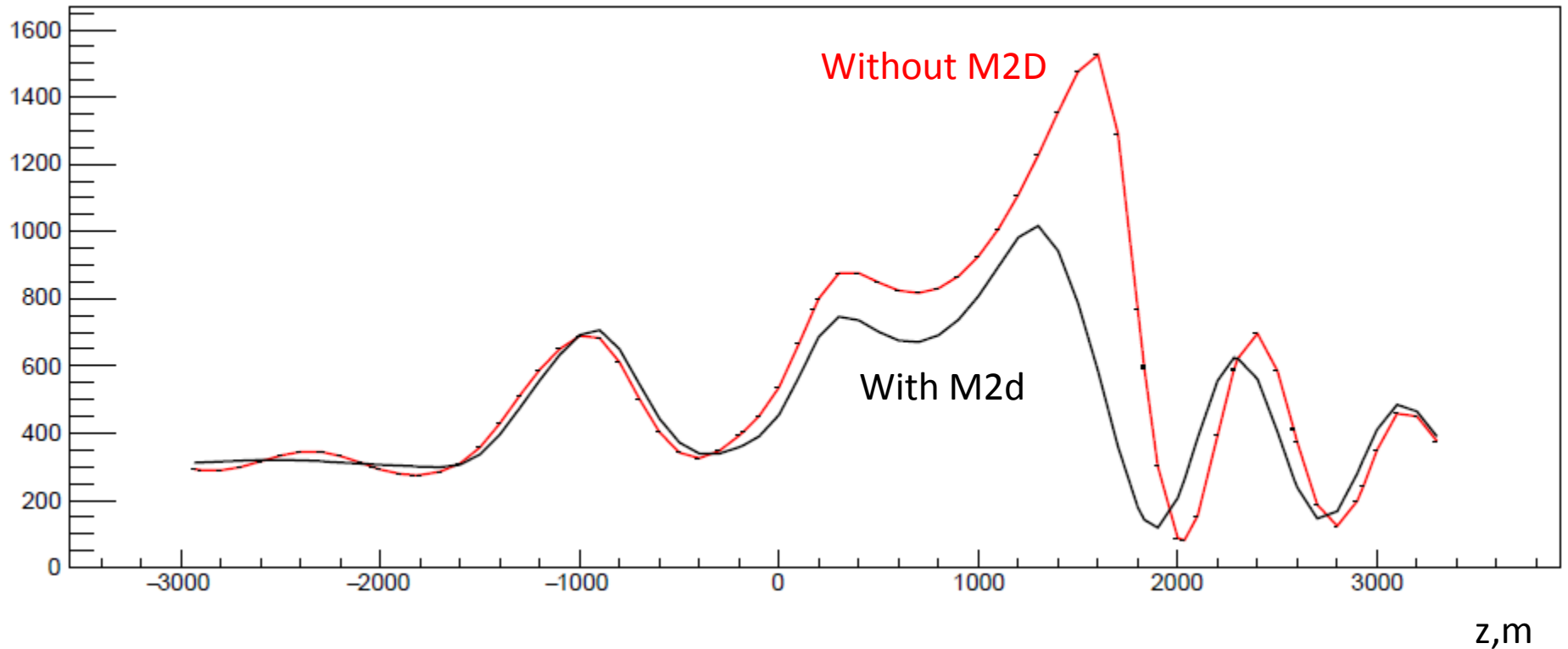
J.Pasternak/IC

Analysis Meeting 17.08.2017

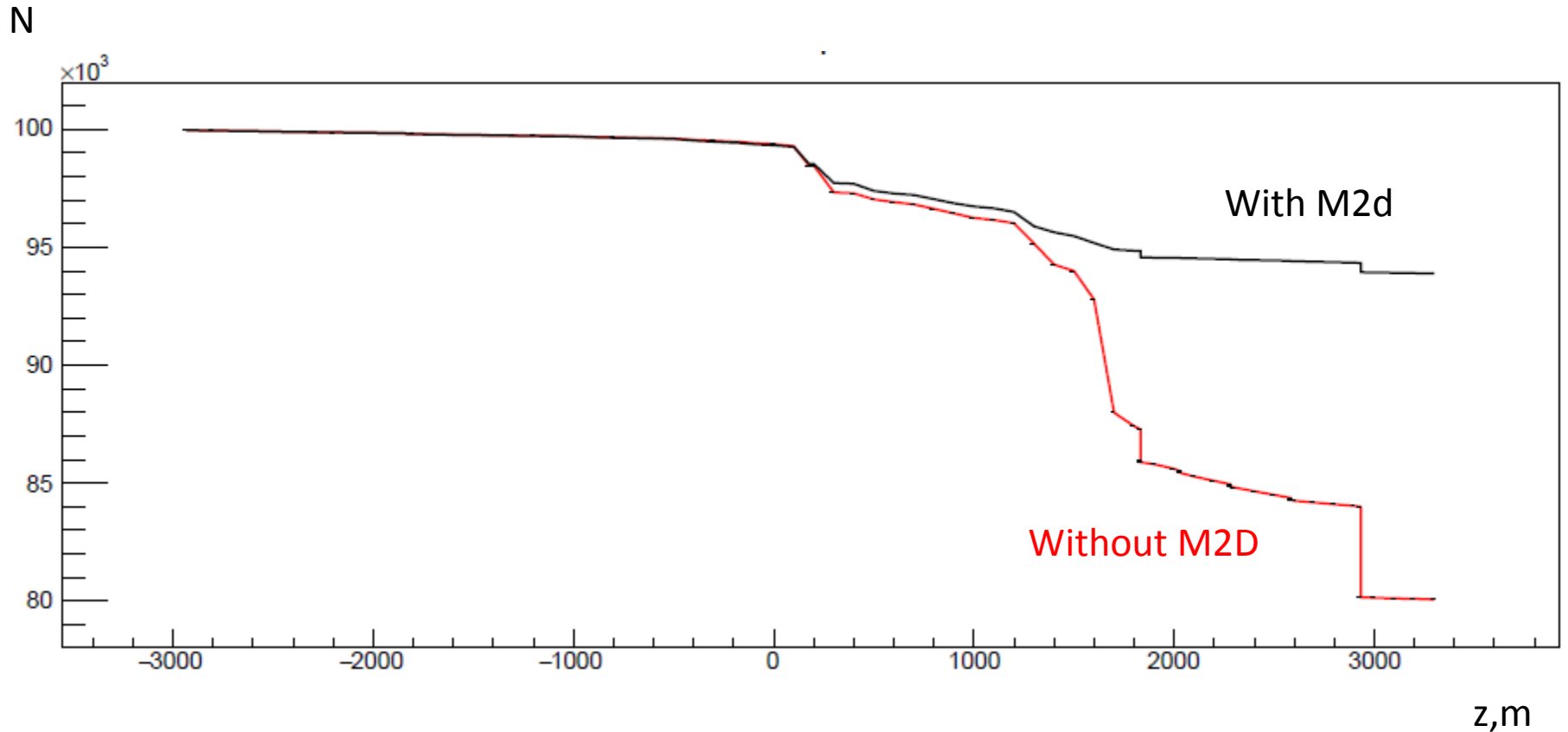
Optics with and w/o M2D

140 MeV/c

Beta, mm

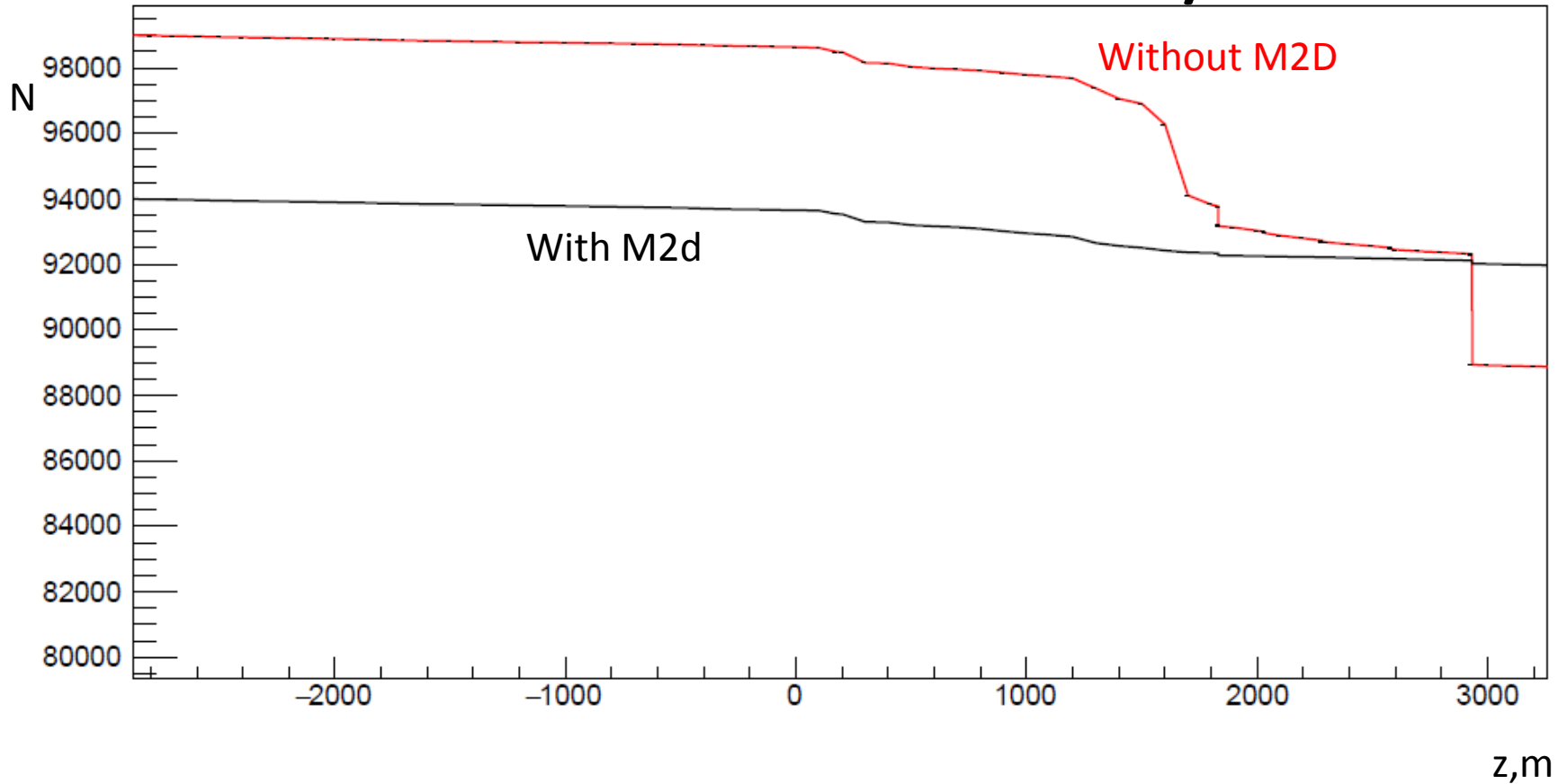


Transmission with and w/o M2D



Beam: 140MeV/c, 6mm, 4.8% dp/p

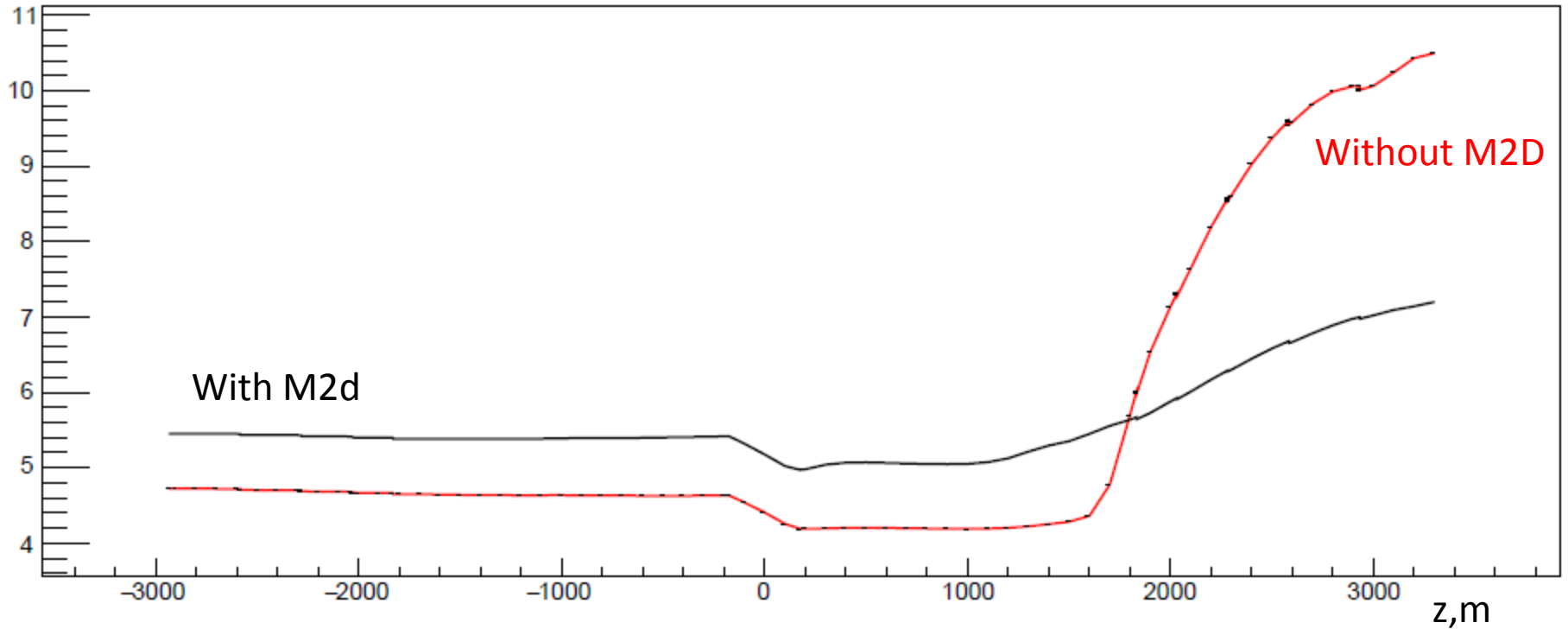
Transmission with and w/o M2D



Beam: 140MeV/c, 4.2mm, 1.5% dp/p

Emittance with and w/o M2D

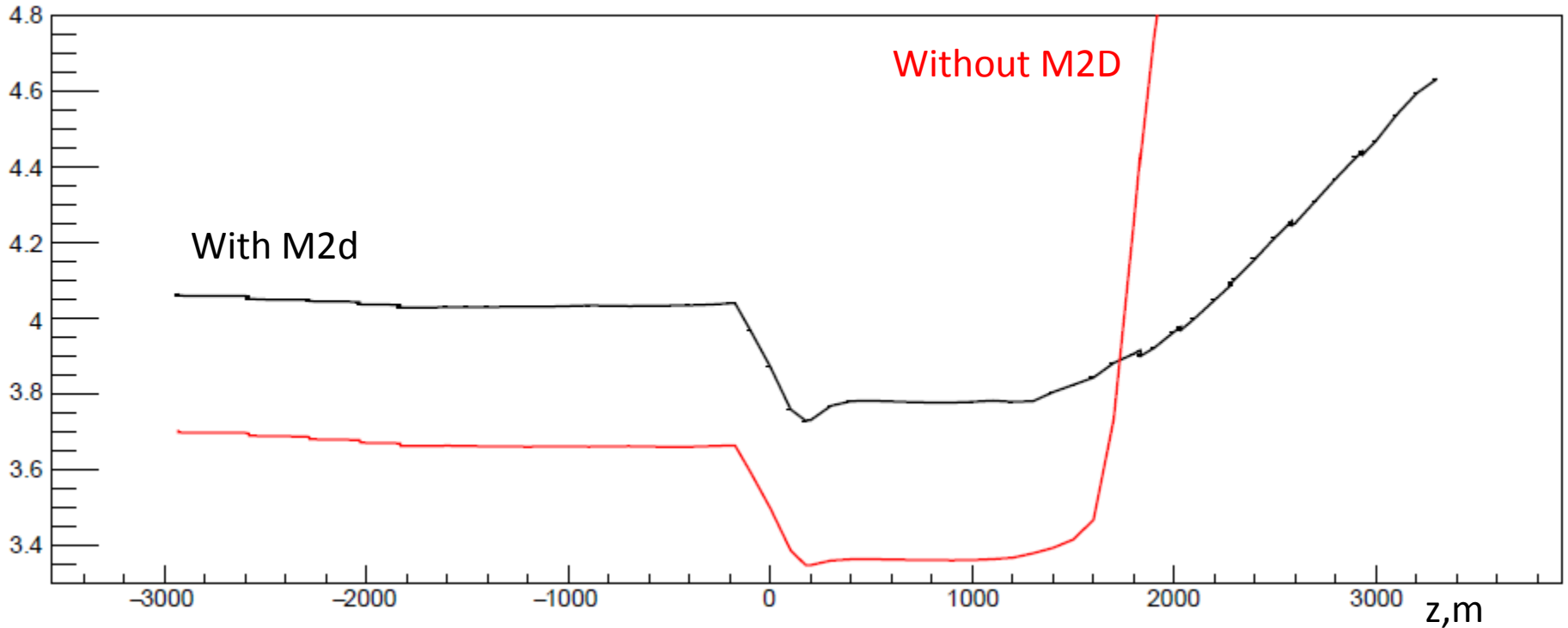
Emittance, mm



Beam: 140 MeV/c, 6mm, 4.8% dp/p

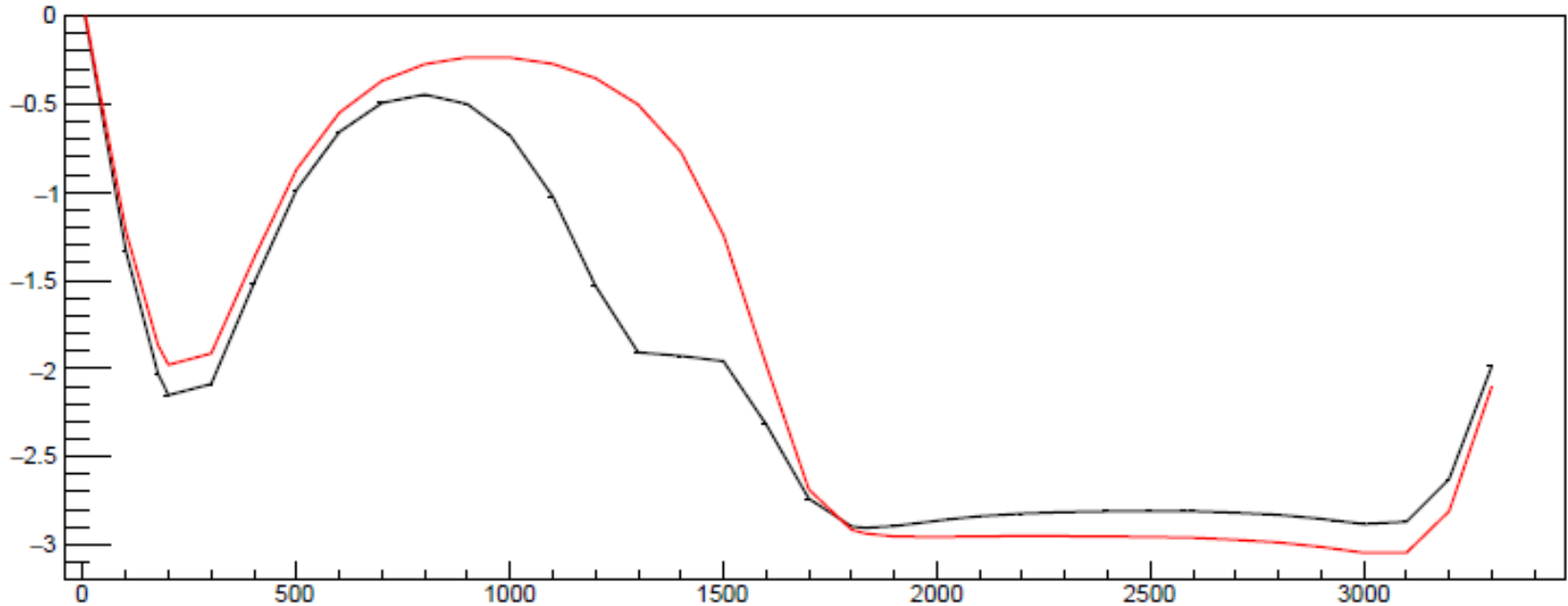
Emittance with and w/o M2D

Emittance, mm



Beam: 140 MeV/c, 4.2mm, 1.5% dp/p

Field in SSD with and w/o M2D



Overshoot of the field causes field non-uniformity in the Tracker and can increase optical heating. Unfortunately we cannot correct with Trims!

Example new setting with M2D on

- Beamline:
 - pionic at 140 MeV/c
- Cooling channel:

Currents in A

Setting	E2u	Cu	E1u	M2u	M1u	FCu	FCd	M1d	M2d	E1d	Cd	E2d
Sol_140_with M2d	205.7	205.7	205.7	168.25	191.0	129.24	-129.24	0.0	-195.72	-205.7	-205.7	-205.7

- Stored energy in SSD ~1.9 MJ
- SSU/FC force 152kN

Example new setting with M2D on with reduced stored energy

- Beamline:
 - pionic at 140 MeV/c
 - Cooling channel:
- Note: MC results shown for this setting

Currents in A

Setting	E2u	Cu	E1u	M2u	M1u	FCu	FCd	M1d	M2d	E1d	Cd	E2d
Sol_140_with M2d	205.7	205.7	205.7	168.25	191.0	129.24	-129.24	0.0	-195.72	-194.3	-194.3	-194.3

- Stored energy in SSD ~1.7 MJ
- SSU/FC force 152kN

Results so far

- Both transmission and emittance evolution can be significantly improved with switching M2d
 - Optical heating can be reduced
- Optimisation focused so far on 140 MeV/c flip, but solenoid mode has been started as well.
- I believe we should try 200 MeV/c with M2D as well.

Comments obtained from Magnet Meeting

- No Trims!
- There was not a strong feeling that larger stored energy is an issue. It was rather suggested to fix SSD current in E-C-E to some value common with other runs (I assume 205.7A at the moment).
- Next update and the MEMO next week.