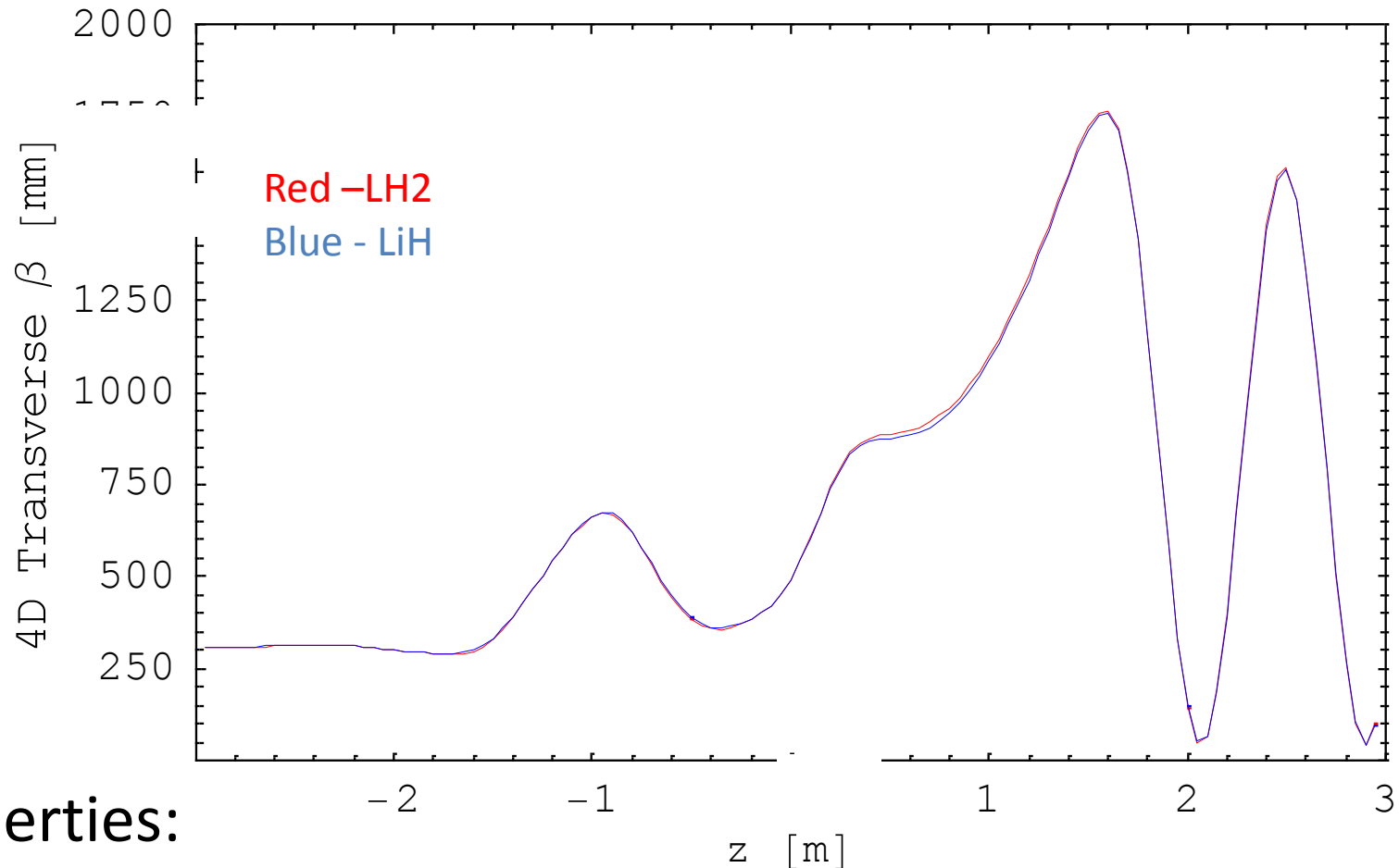


Run Plan wrt M2

J.Pasternak/IC/VC_03.08.2017

Optics WITHOUT M2D assuming (strong focusing, flip, 140 MeV/c)



Properties:

- large value of betatron function downstream absorber
- Very large bet beating in TKD

• Both will generate heating and reduced transmission!



Optimization result - Continued



- Variable values corresponding to the previous results:

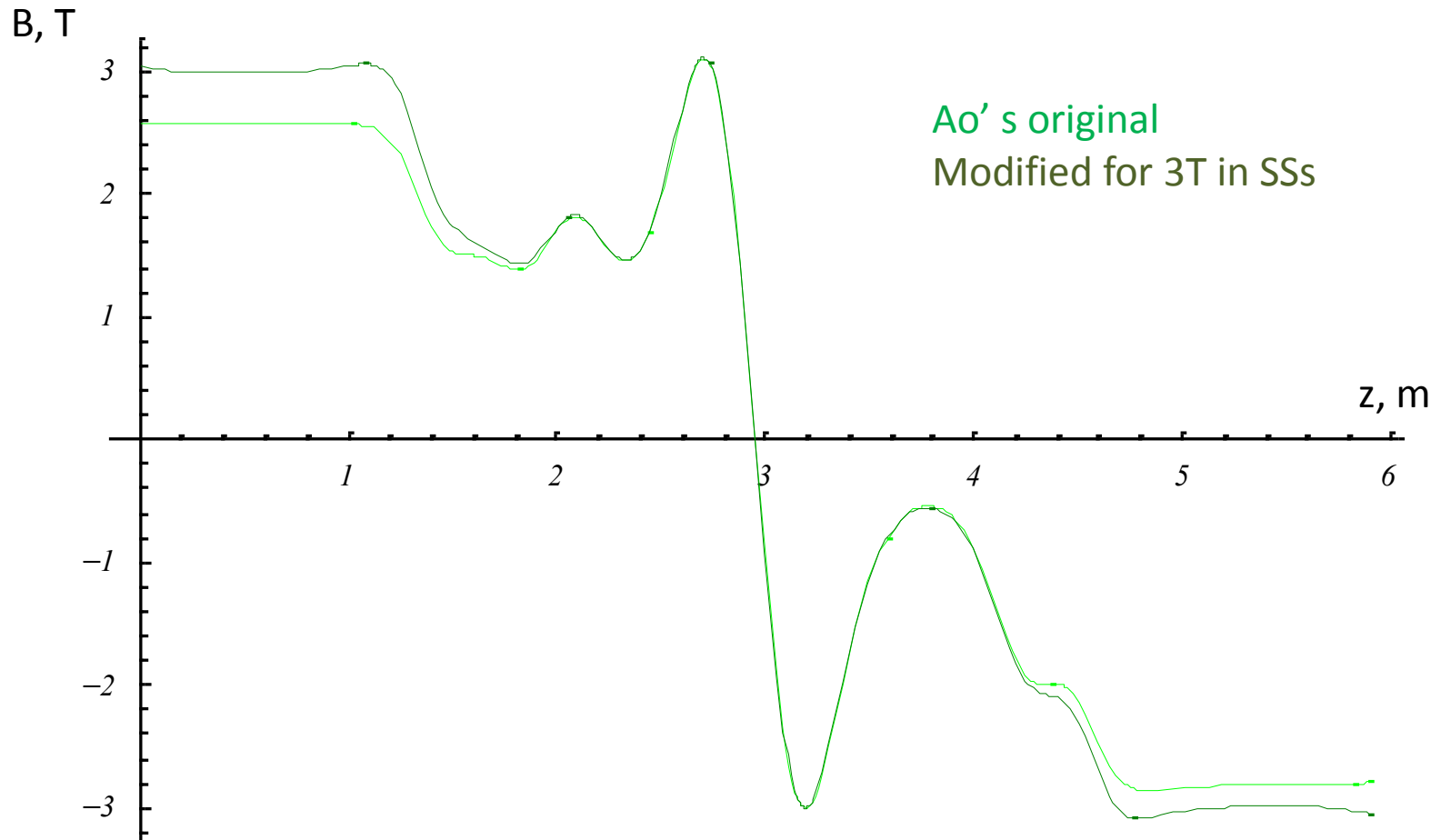
variable	flip, 140	flip, 200	flip, 240	sole, 140	sole, 200	sole, 240
x_1	0.64	0.68	0.80	0.75	0.72	0.89
x_2	116.40	150.40	251.62	241.14	219.81	222.69
x_3	133.01	253.18	150.98	225.42	162.66	146.06
x_4	181.21	222.94	126.80	53.52	55.95	64.09
x_5	-205.95	-242.47	-244.00	147.05	205.66	161.48
x_6	-0.71	-0.5	-0.70	0.51	0.51	0.70
$\Delta\epsilon/\epsilon_i$	-7.7%	-4.0%	-2.2%	-2.2%	-2.8%	-2.3%
T	93%	93%	90%	91%	92%	90%

	Current (A)
E2U	$253.23 \times x_1$
CU	$277.98 \times x_1$
E1U	$246.2 \times x_1$
M2U	x_2
M1U	x_3
FCU	x_4
FCD	x_4 (solenoid); $-x_4$ (flip)
M1D	0
M2D	x_5
E1D	$246.2 \times x_6$
CD	$277.98 \times x_6$
E2D	$253.23 \times x_6$

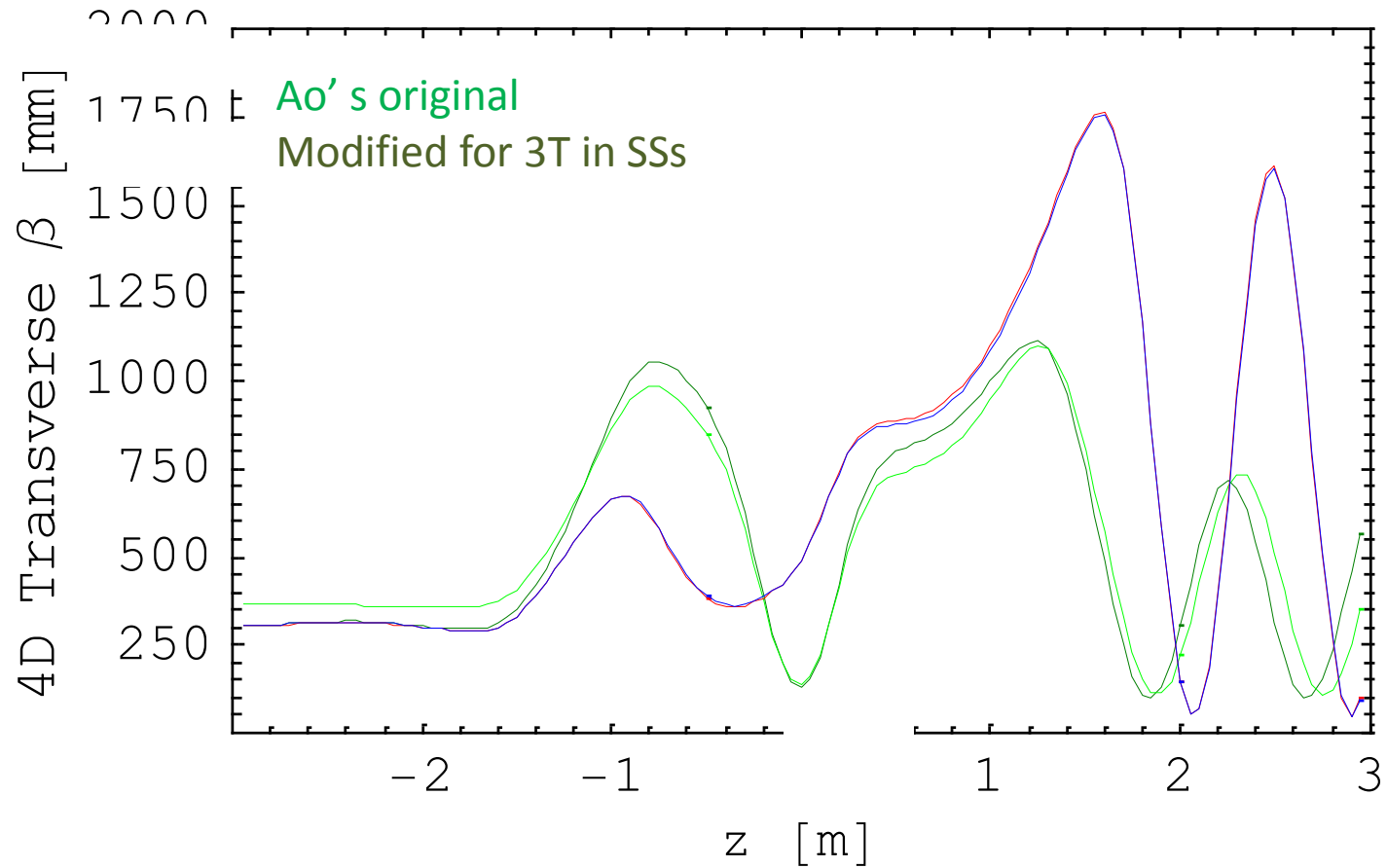
- In each run mode, we are able to deliver an ensemble of particles that can be cooled in the MICE Step IV lattice, with at least 90% transmission to the TOF2 without M1D. In most of them, the normalized transverse emit. reduction is more than 3%;

I take Ao's 140 MeV/c, flip

Bz on axis (T vs m)



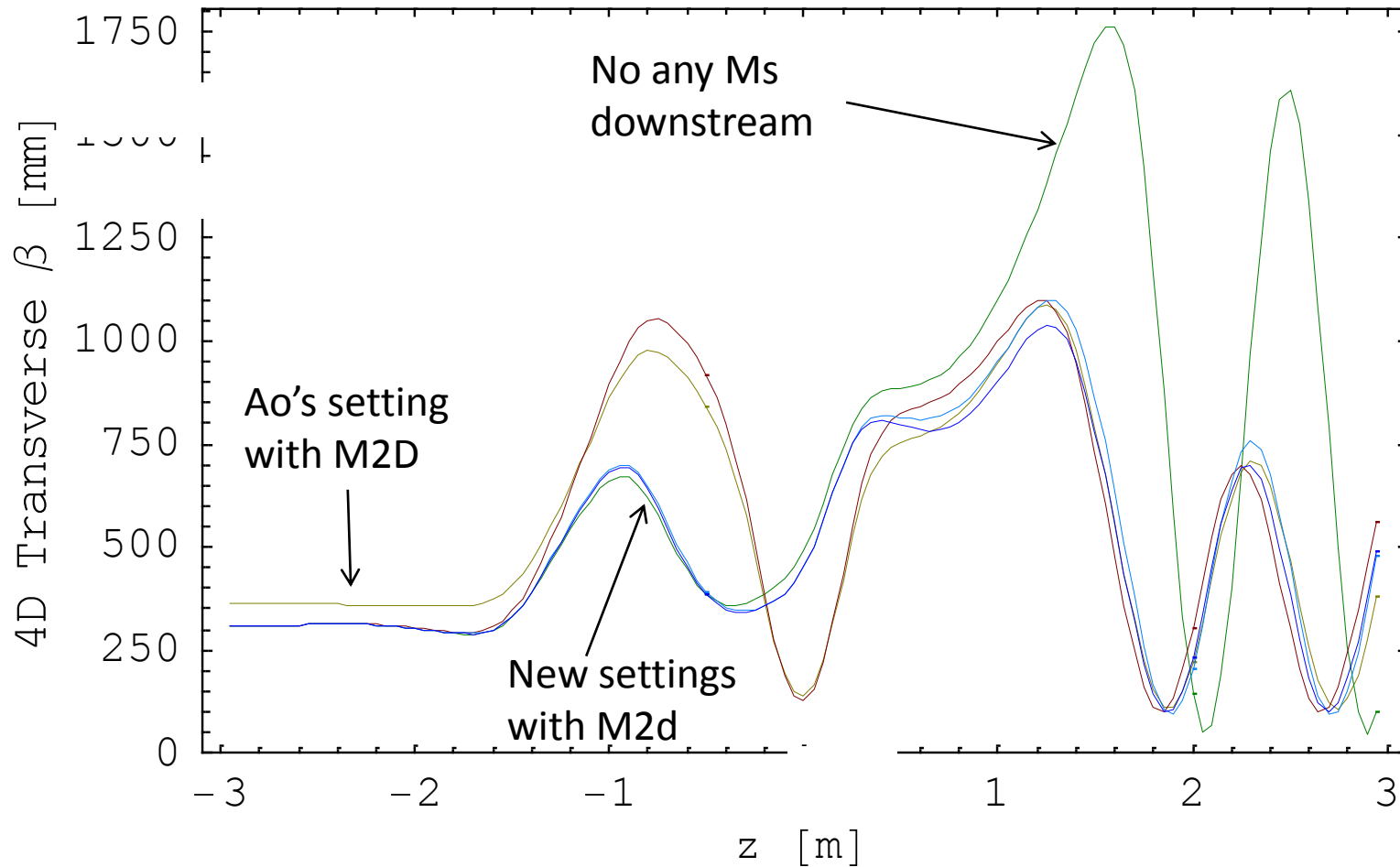
Optics with and without M2D



Need for new settings with M2D

- The setting with M2D promises better performance
 - Ao's setting seems v. good
 - We should be able to have 3T in SSs with a very similar performance
 - However, the FC current is beyond what we can achieve in the channel!
- Can we reduce the FC current, while keeping the performance high?

Example of optivc results, flip, 140 MeV/c



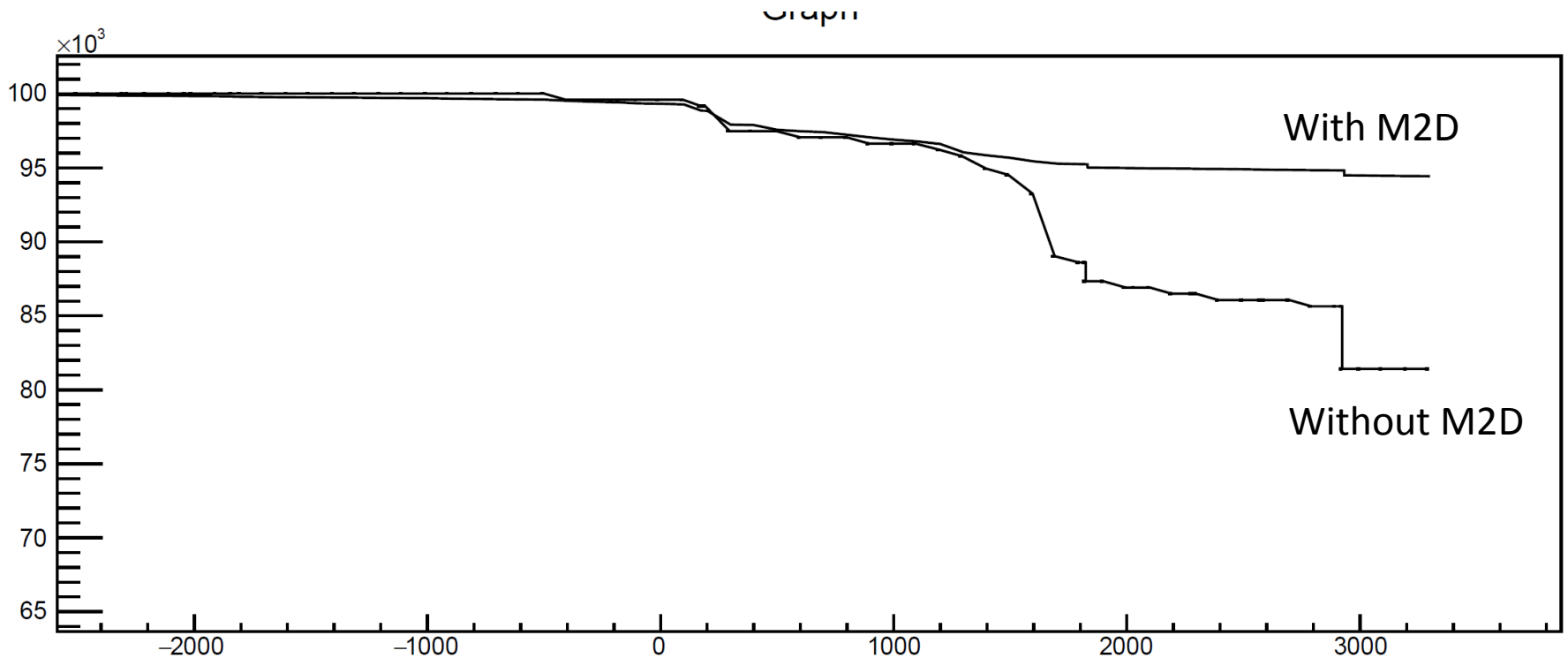
Example new setting with M2D on

- 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

Transmission Results, preliminary



This is the effect of switching M2d on transmission!



Data Taking plan for IH2



- 36 days (19 Sep 2017 - 27 Oct 2017)
- What are the priorities?
- What order to we want to take the risks?
- Propose
 - Fill IH2 (5 days, before data taking starts)
 - Field-off scattering data (2 days)
 - Ramp magnets (5 days)
 - Flip mode, no M2D, one setting (3 days)
 - Flip mode, M2D, one setting (3 days)
 - Boil off IH2 - subsequent settings are empty (1 day)
 - Flip mode, M2D, one setting (3 days)
 - Flip mode, no M2D, one setting (3 days)
 - Field-off scattering data (3 days)
- 23 days + 13 contingency
- Analysis team will prepare “shopping list” for contingency
 - Hard to recondense IH2

Additional comments

- It would be better to start with magnets on and push field-off data to just before “boil off”.
 - Is this possible?
- I am personally no longer so sure, if it should be flip mode
 - More study and discussion needed
- I believe we should aim for two settings with M2D (140MeV/c and 200 MeV/c) with the best possible optics.