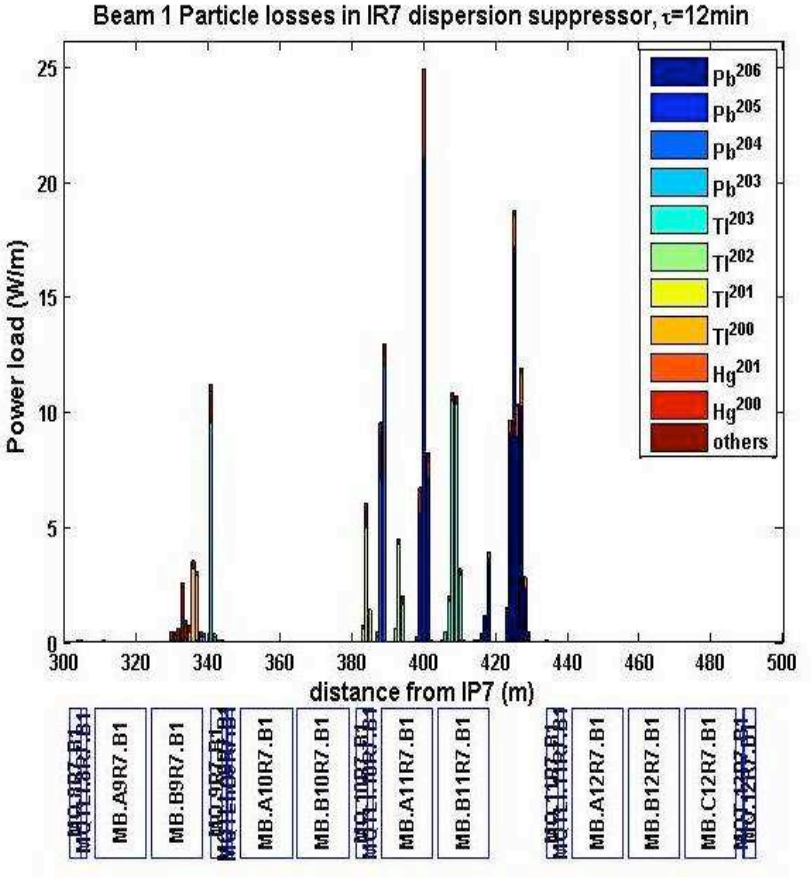
Revised proposal of BLMs locations at IR7 for ion losses

G.Bellodi, H.Braun

CWG meeting, 22 May 2006

Collision:

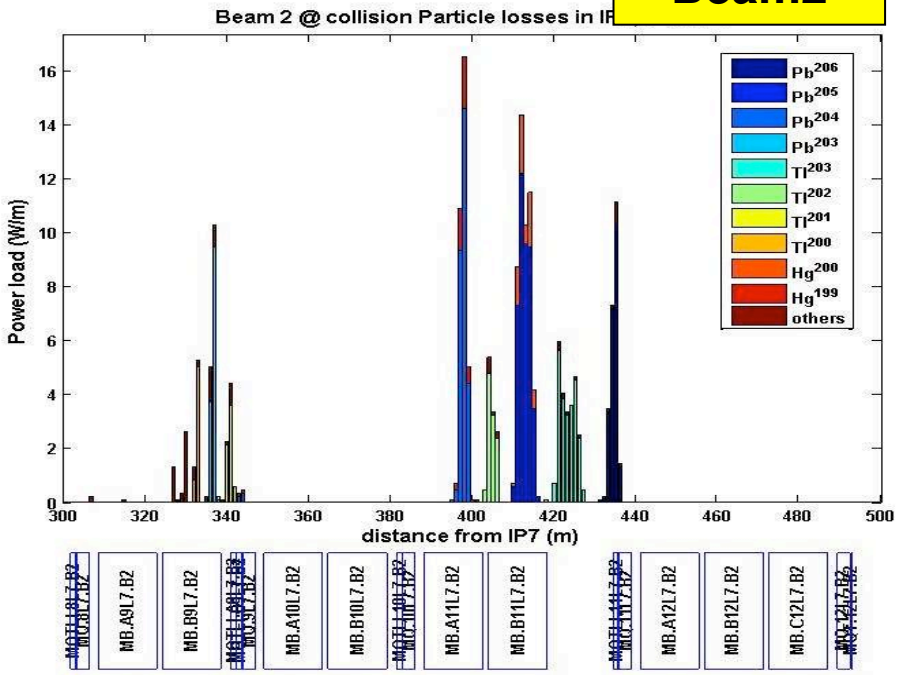
Beam1

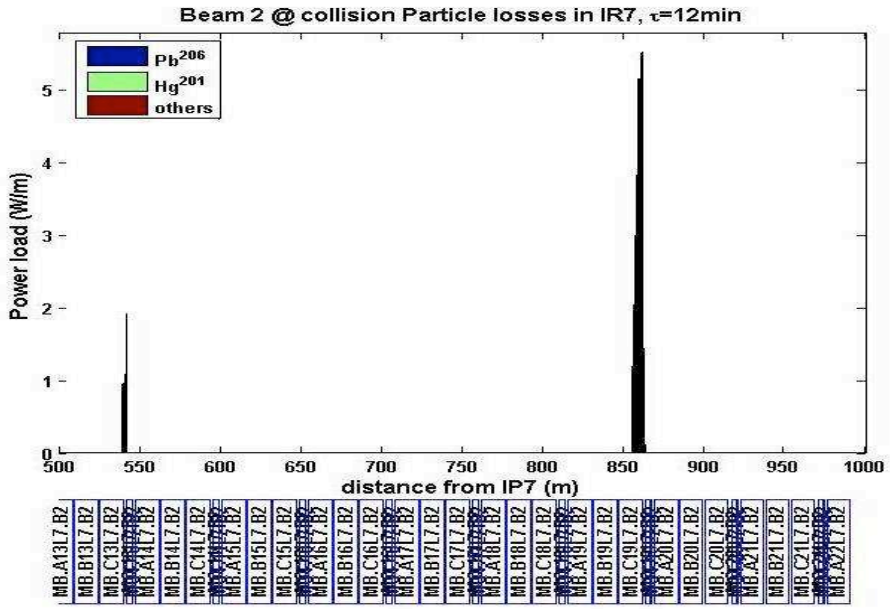


Losses confined to IR7 dispersion suppressor, cells 9 & 11

Two peaks downstream in the arc for Beam2

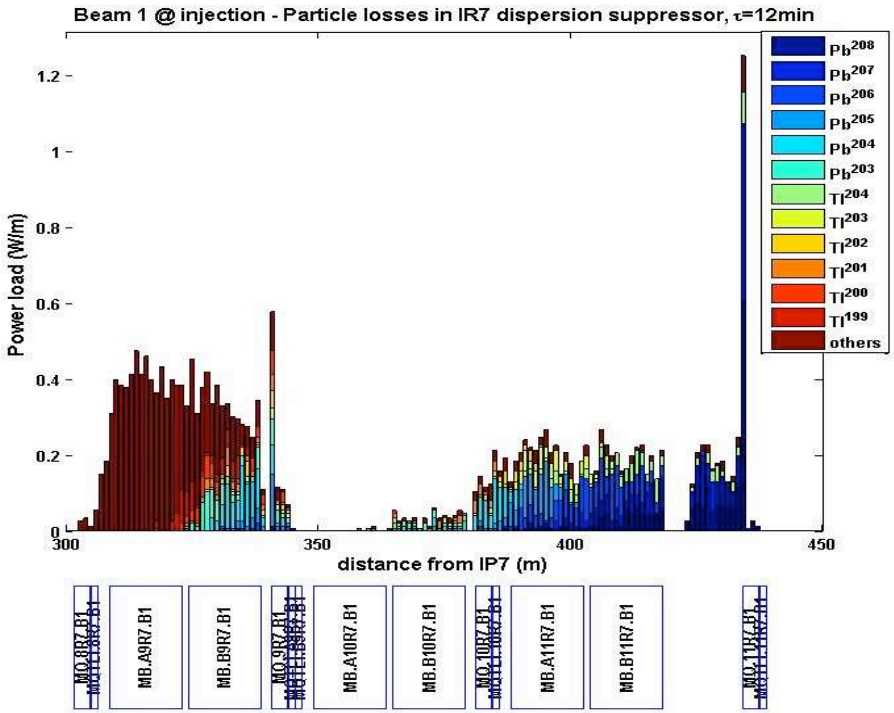
Beam2



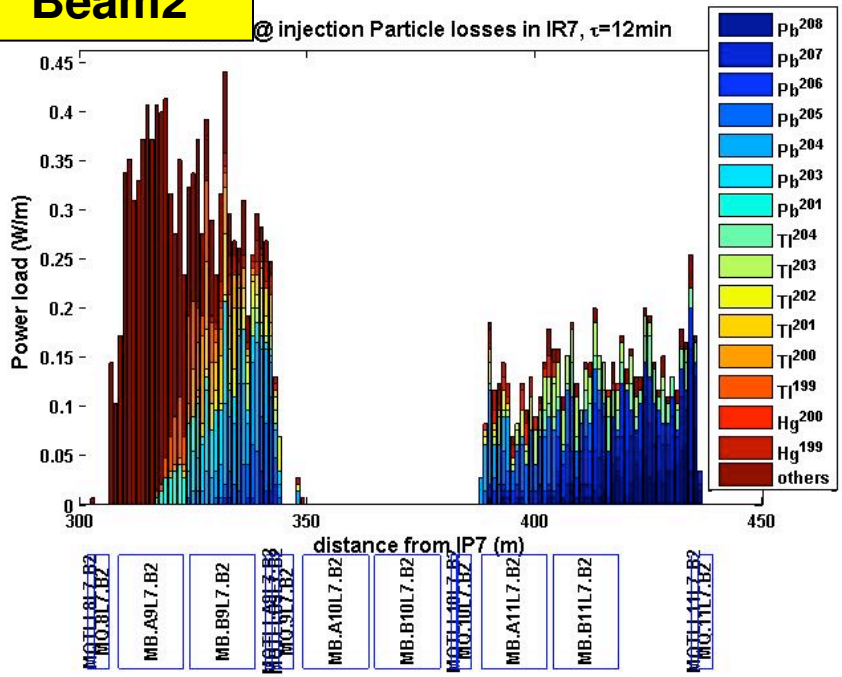


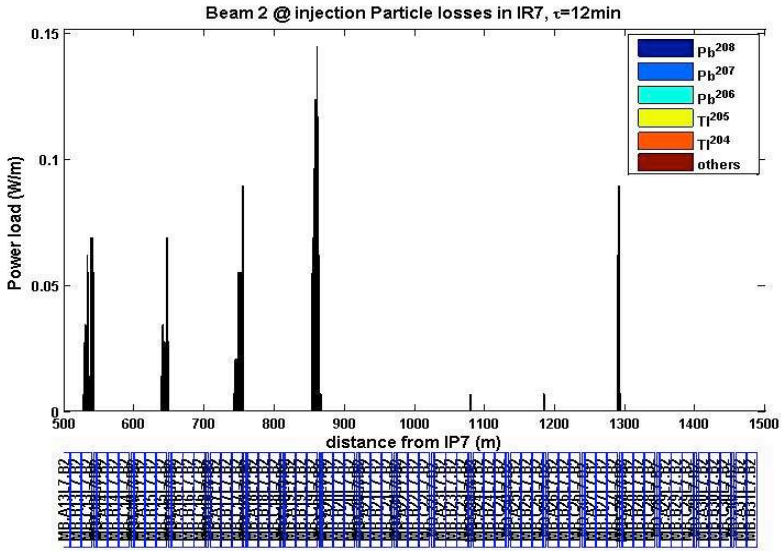
Injection:

Beam1



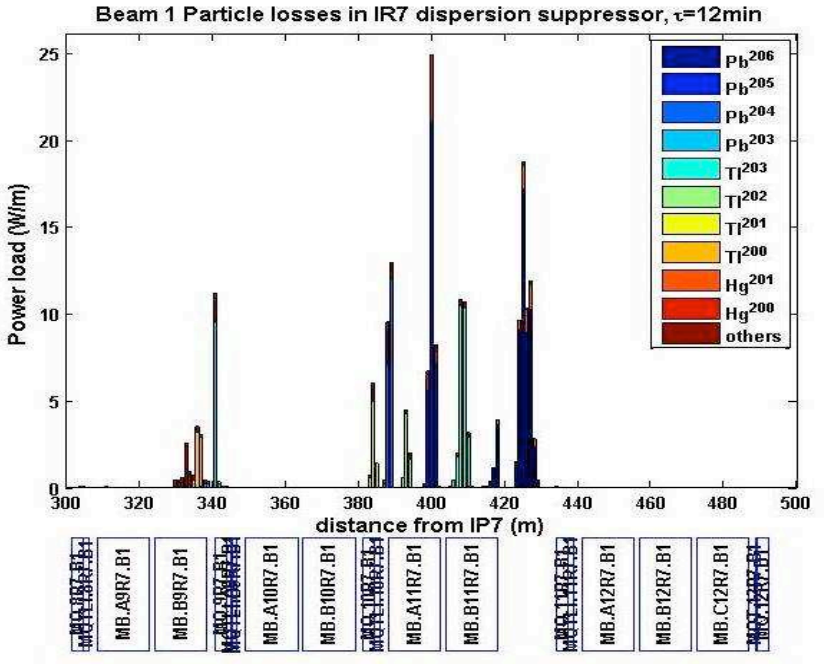
Beam2



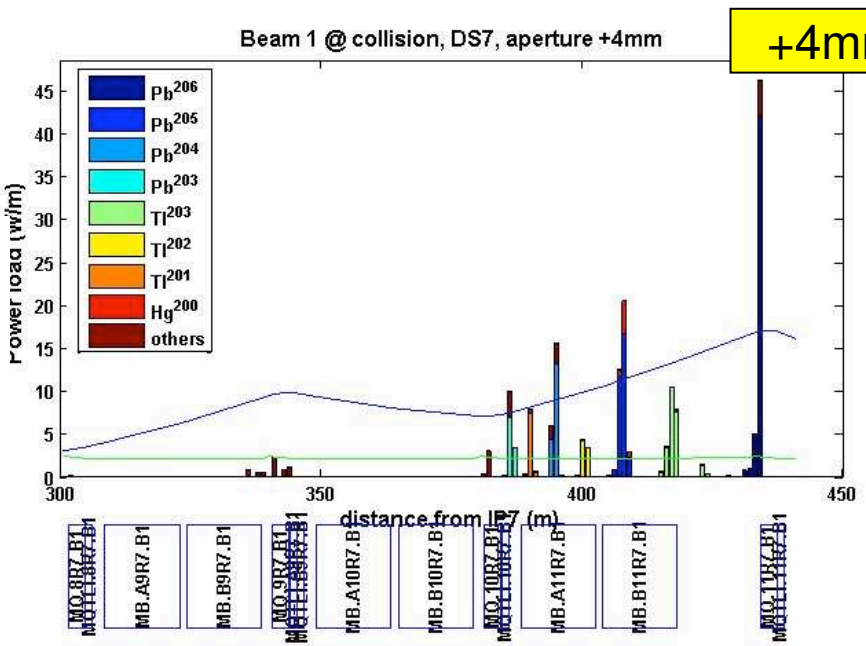


Aperture sensitivity (Beam1):

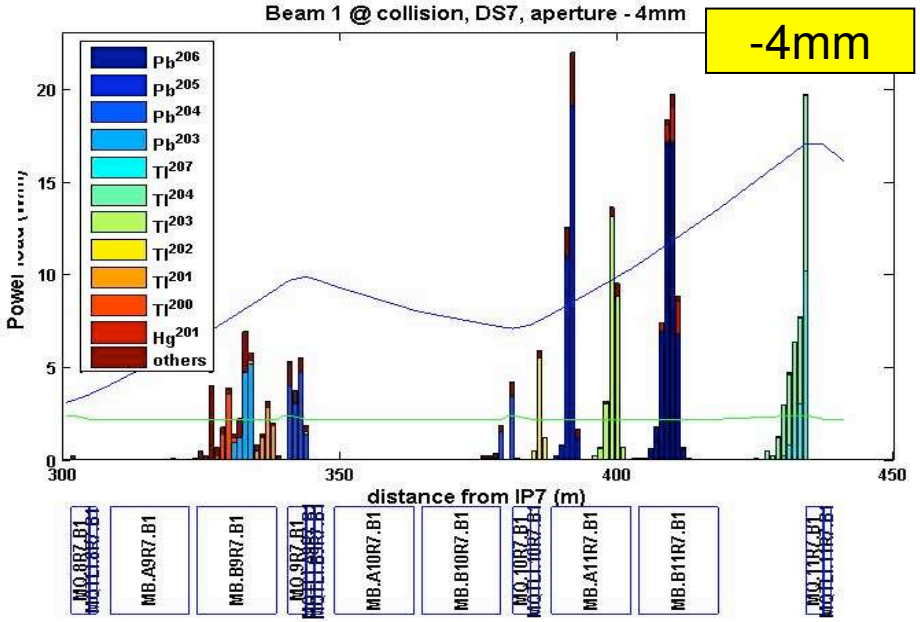
nominal



+4mm



-4mm



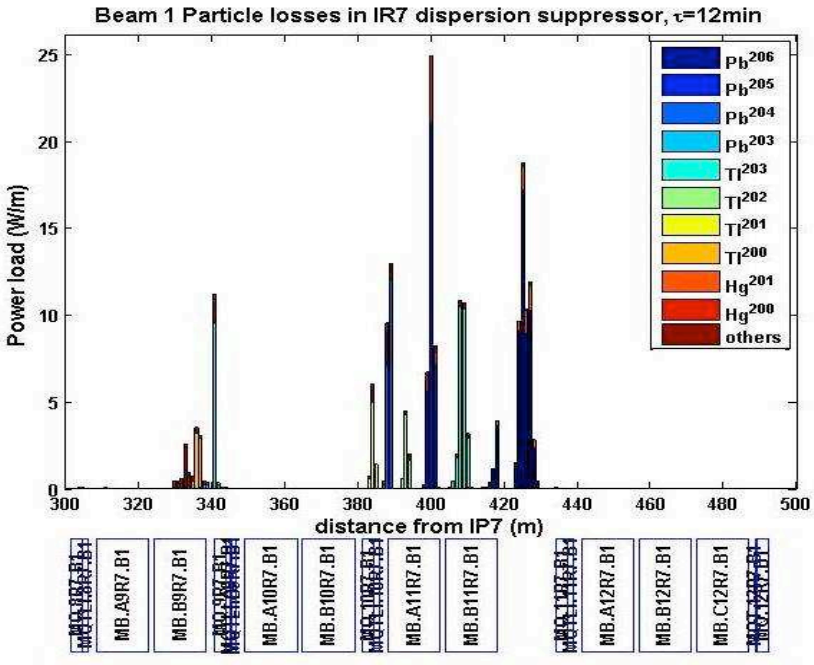
Effective momentum error: $\frac{\Delta P}{P} = \frac{Z_1 A_2}{Z_2 A_1} - 1$

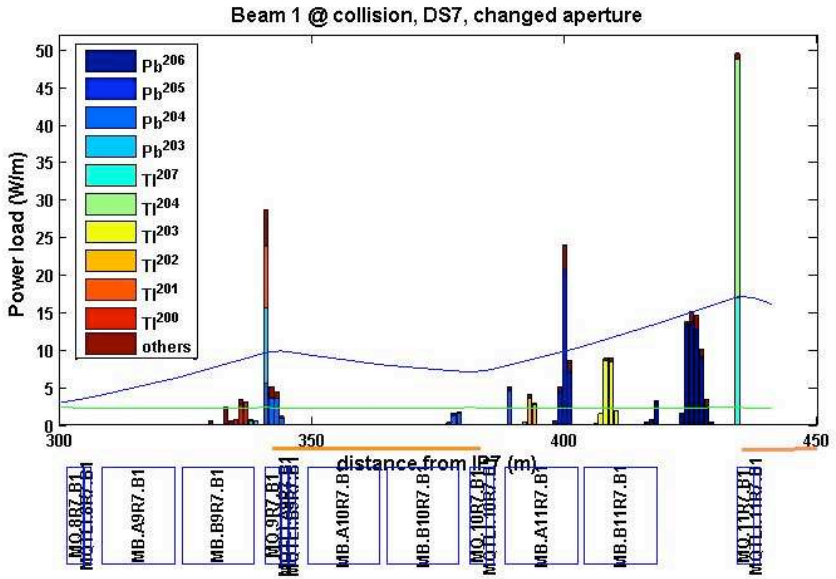
^{207}Tl → +0.75%

^{204}Tl → - 0.71%

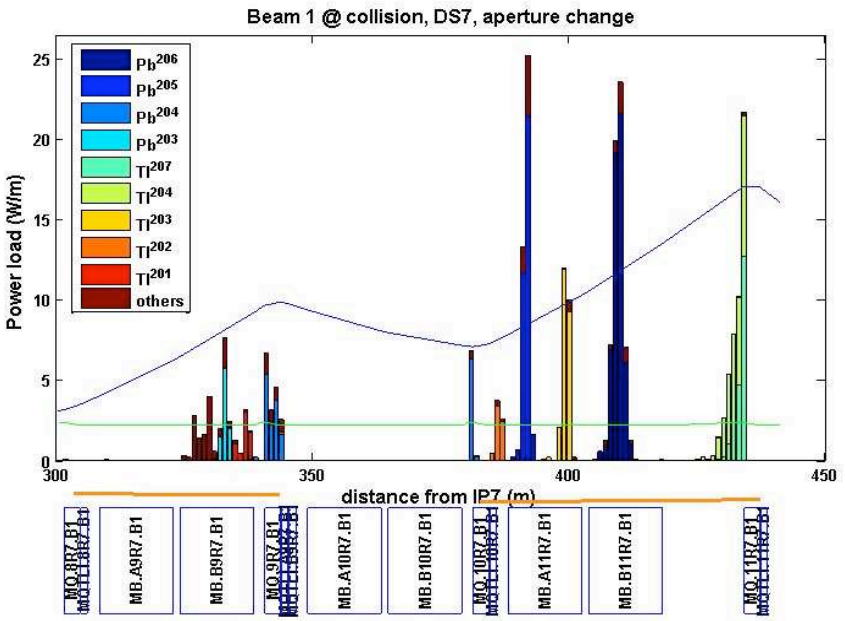
Aperture sensitivity (Beam1):

nominal



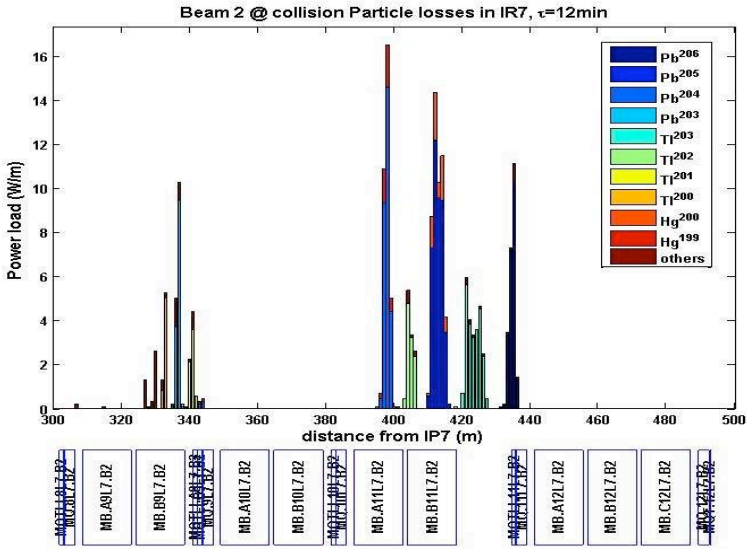


aperture decreased by 4mm

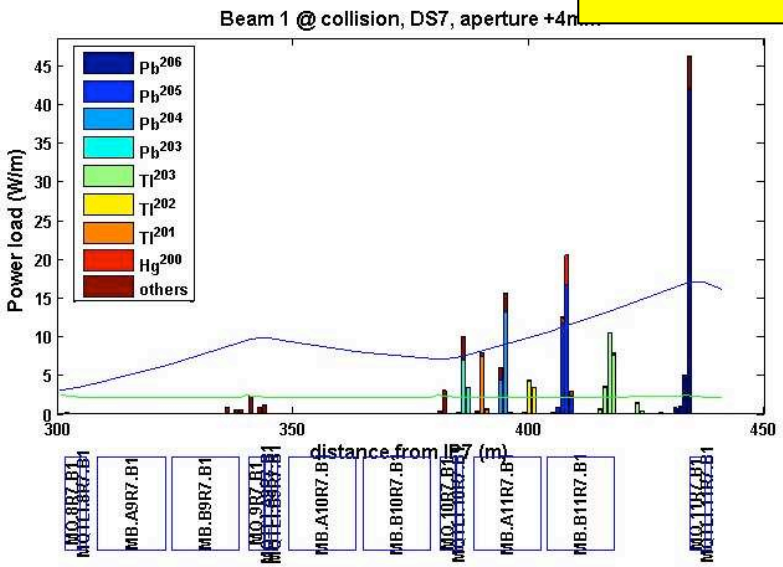


Aperture sensitivity (Beam2):

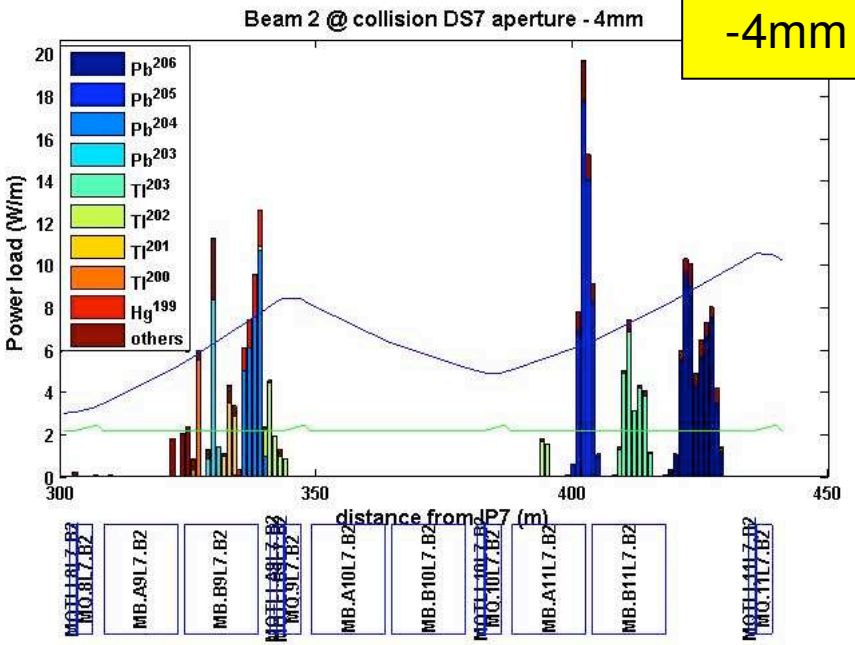
nominal



+4mm

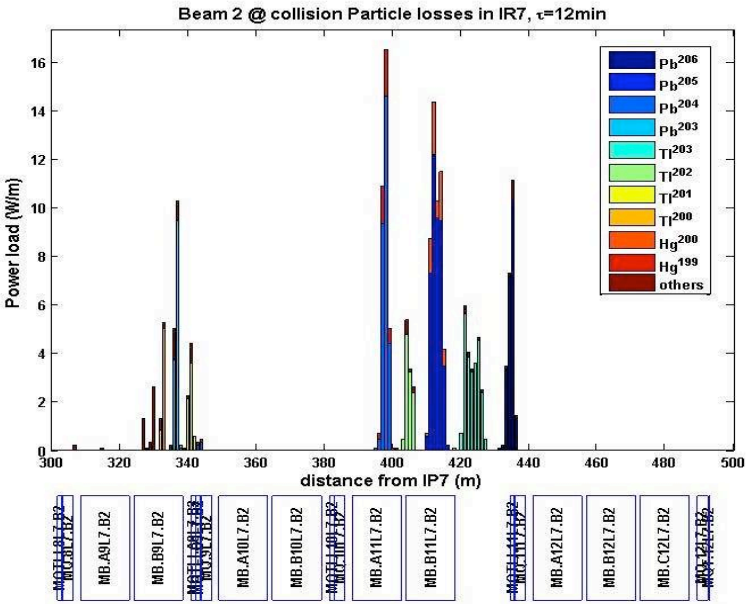


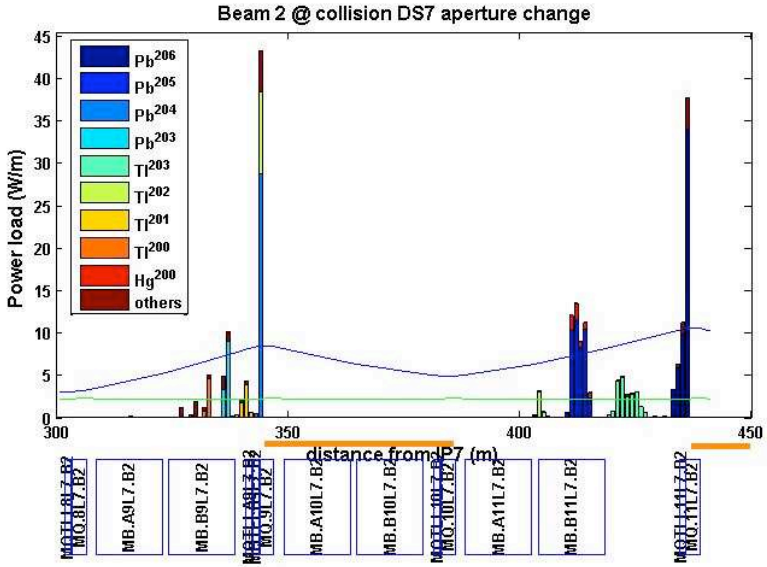
-4mm

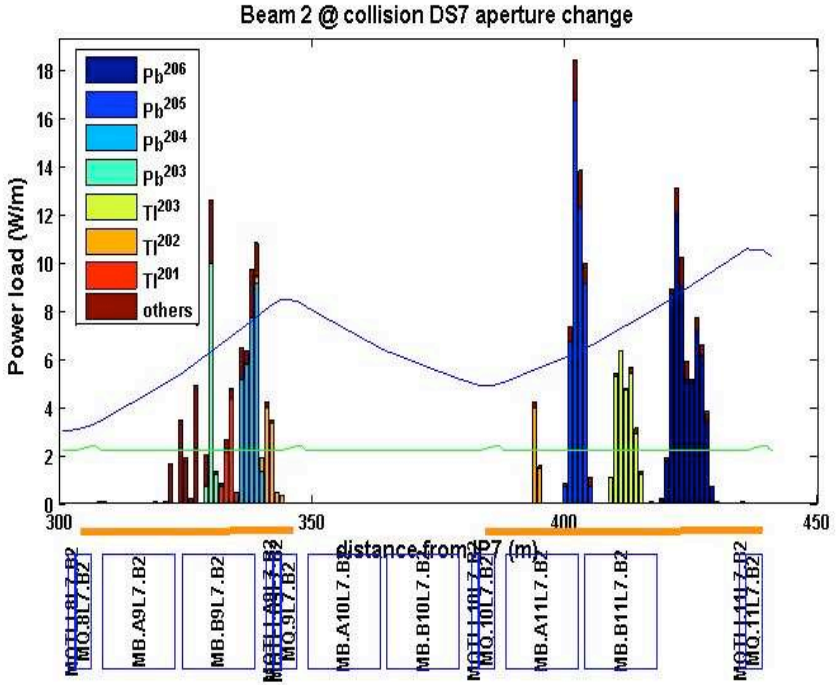


Aperture sensitivity (Beam2):

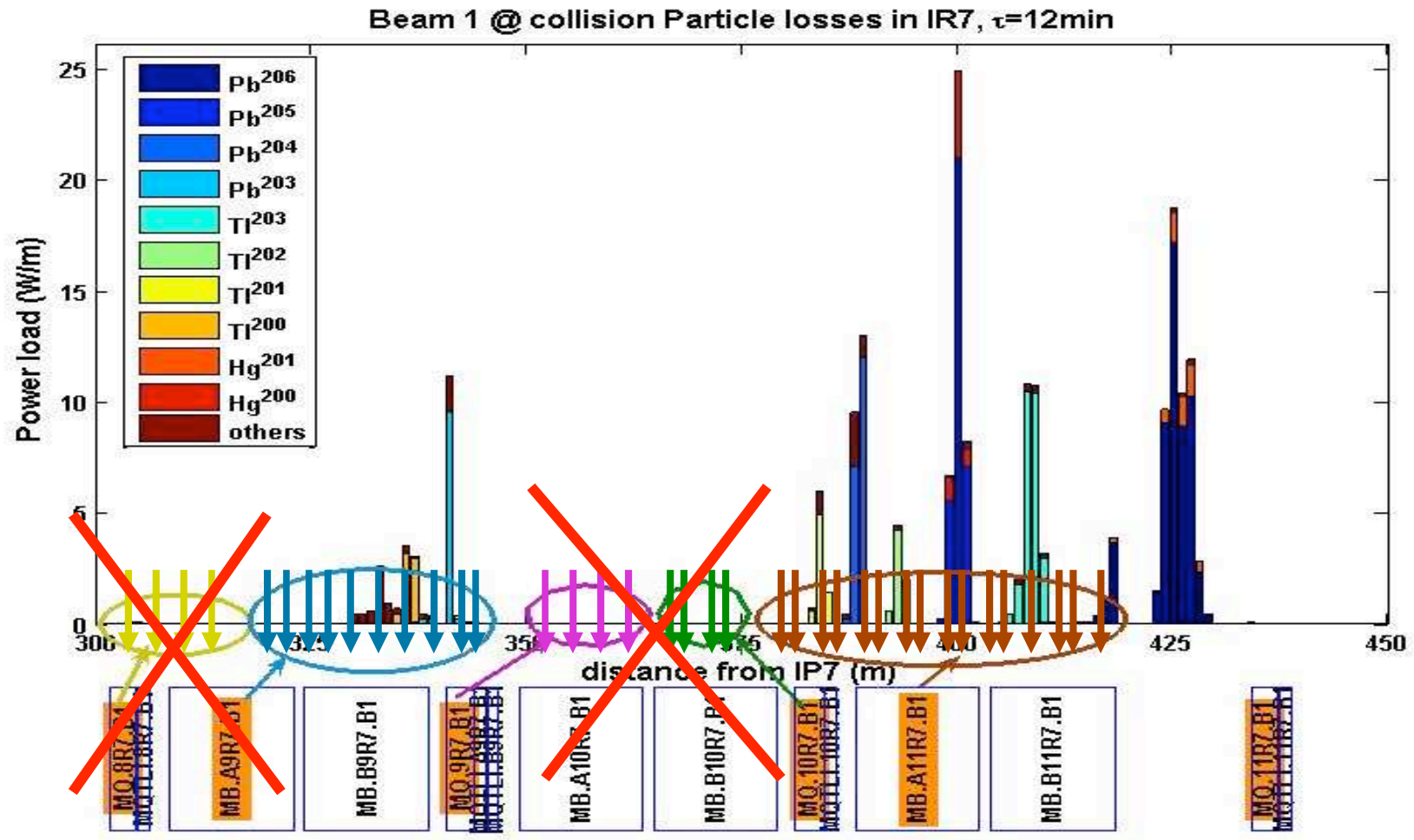
nominal



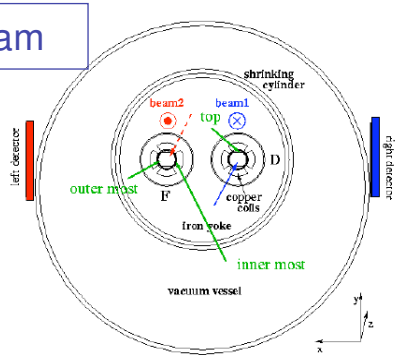




aperture decreased by 4mm



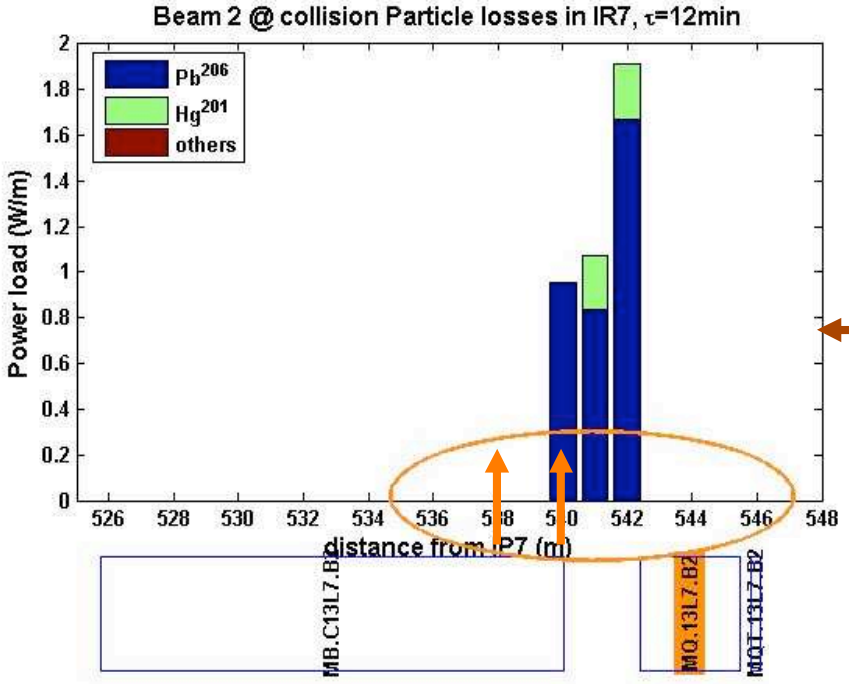
B. Dehning's team



-**New**: 2.5 m spacing in cells 9 (downstream dipole) & 11, no coverage in cell 10

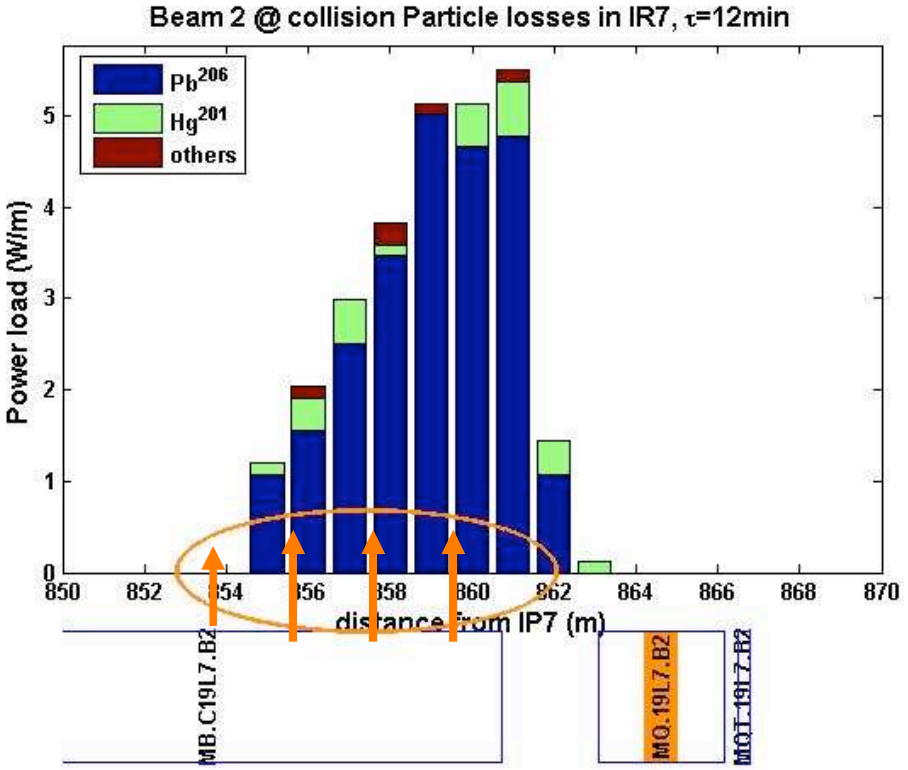
-Transverse position: inside (left) for beam2, outside (right) for beam1

Beam2, arc region



cell 13

cell 19



Beam 1

BEAM	IP	SLOT	s(m) from IP7	Transv pos	MAD-X name	cold mass type
1	7	BJBAP.A9R7		Outside	MB.A9R7.B1	MBA.9R7
			317			
			320			
			322.5			
			325			
			327.5			
			330			
			332.5			
			335			
			337.5			
			340			
1	7	BJBAP.B9R7		Outside	MQ.9R.B1	MQ.9R7
			345			
1	7	BJBAP.A10R7		Outside	MQ.10R7.B1	MQ.10R7
			376.5			
1	7	BJBAP.A11R7		Outside	MB.A11R7.B1	MBA.11R7
			379.5			
			386			
			388.5			
			391			
			393.5			
			396			
			398.5			
			401			
			403.5			
			406			
			408.5			
			411			
			413.5			
			416			
			418.5			

4 patches, 27 BLMs

Beam 2

BEAM	IP	SLOT	s(m) from IP7	Transv pos	MAD-X name	cold mass type
2	7	BJBAP.A9L7		Inside	MB.A9L7.B2	MBB.9L7
			320			
			322.5			
			325			
			327.5			
			330			
			332.5			
			335			
			337.5			
			340			
			342.5			
2	7	BJBAP.A11L7		Inside	MB.B11L7.B2	MBA.11L7
			388.5			
			391			
			393.5			
			396			
			398.5			
			401			
			403.5			
			406			
			408.5			
			411			
			413.5			
			416			
			418.5			
2	7	BJBAP.B11L7		Inside	MQ.11L7.B2	MQ.11L7
			433			
2	7	BYPLM.A13L7		Inside	MQ.13L7.B2	MQ.13L7
			538.5			
			541			
2	7	BYPLM.A19L7		Inside	MQ.19L7.B2	MQ.19L7
			854			
			856.5			
			859			
			861.5			

5 patches, 30 BLMs

BLMs coverage:

Philosophy :

Adding 1mm to aperture (all elements) causes a shift in the beam loss peaks by up to 2m

BLMs coverage of IR7:
3 patches available in cells 8,9,11 (dipoles) X 8 channels (max) X 2 BLMs

2 channels available on quad patches (regions 8,9,10,11,13)

Need tight coverage of cells 9-11

Numbers:

BLM active length = 40 cm

Dipole length = 14.3 m (x2)

Long. spread of energy deposition=

2.5 m FWHM

peak @ 1.5 m from impact

For coil deposition peak @ 30cm from impact point

RBruce