

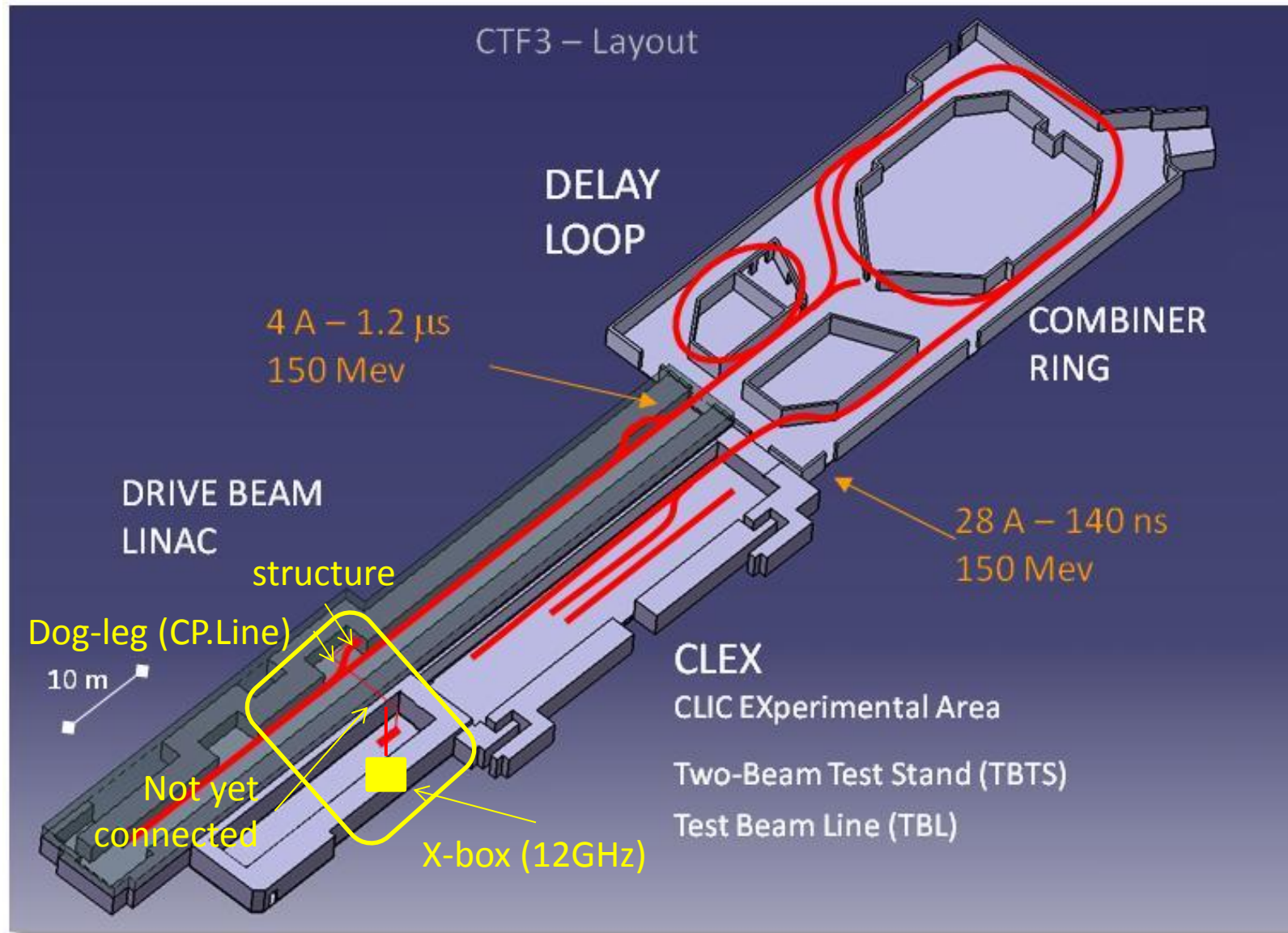
Dogleg Experiment

J.L. Navarro

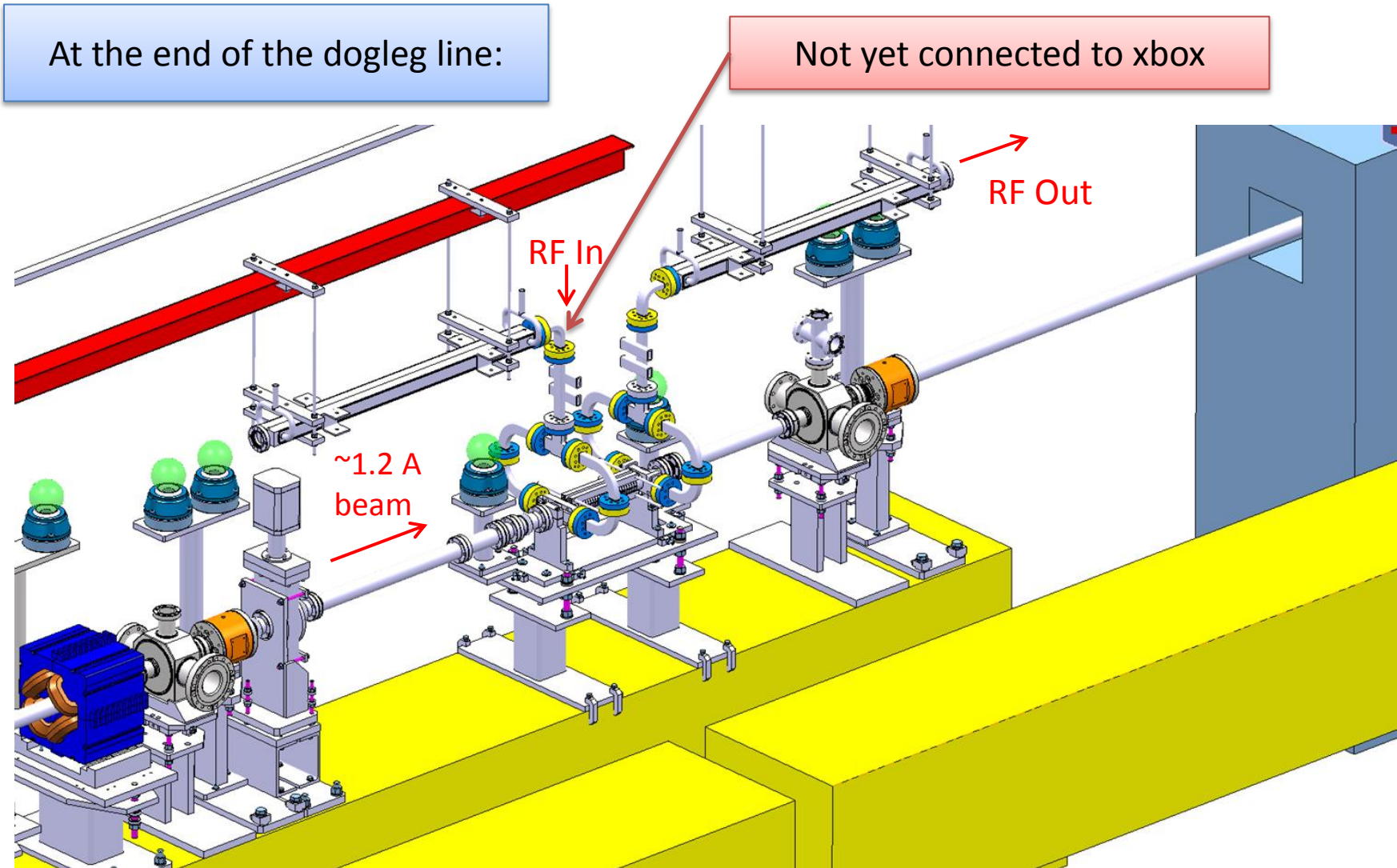


- Fast introduction to the experiment
- The data acquisition system
- The optic design
- First results
- Time for discussion

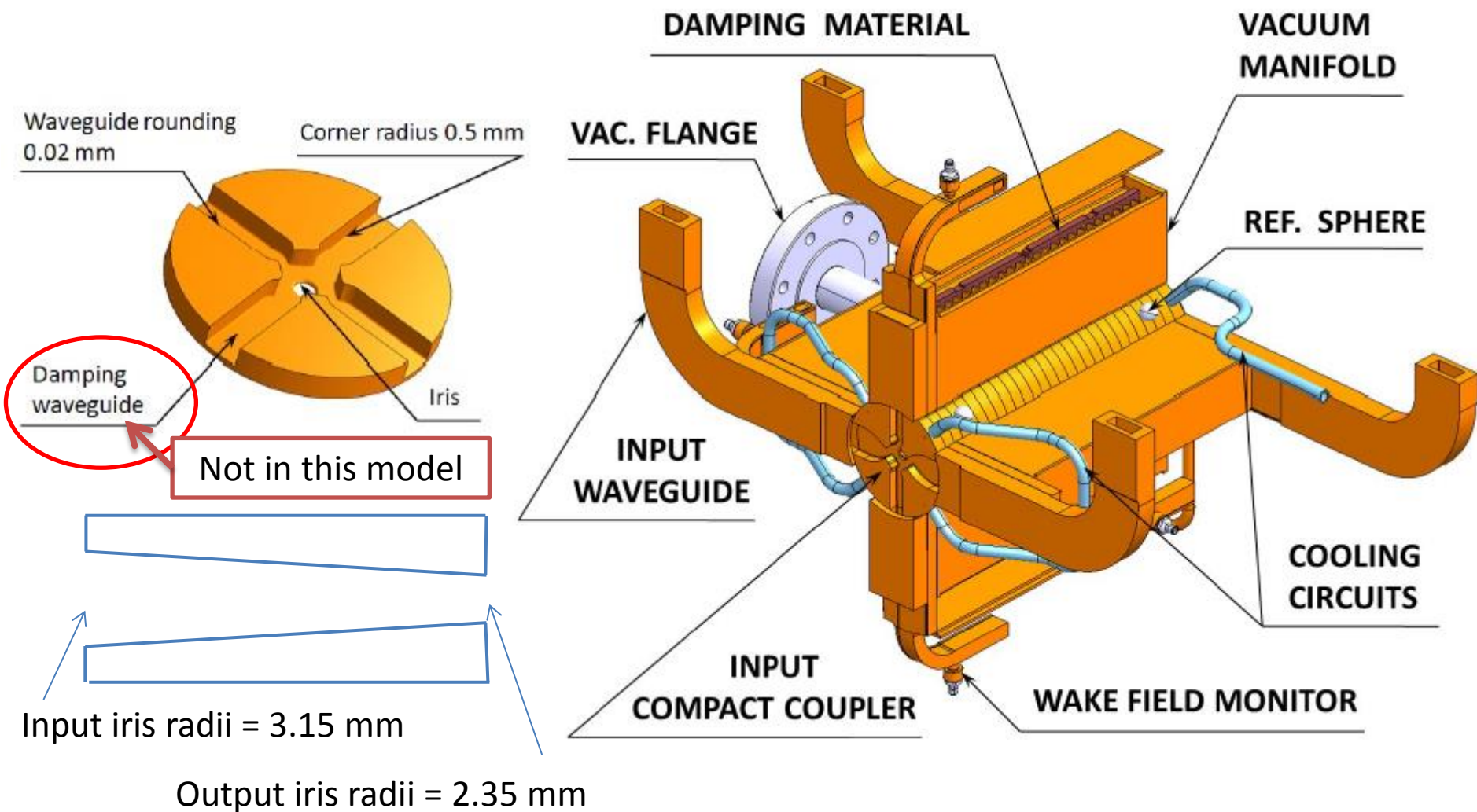
Introduction: Location of the experiment



Introduction: What is the experiment?

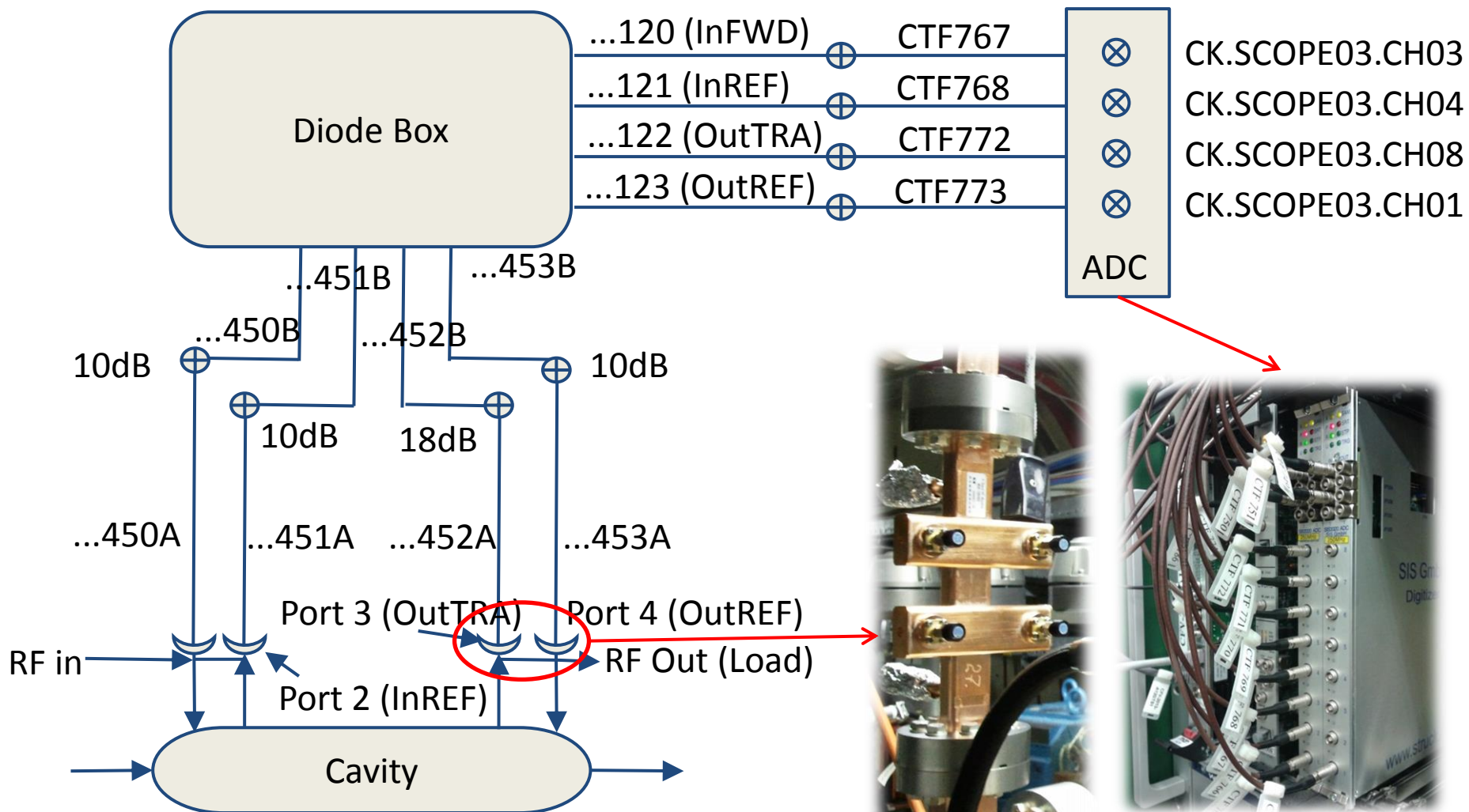


Introduction: The T24 structure



Main goal: Testing an accelerating structure (T24) with and without nominal beam loading and measure the breakdown rate in both conditions.

The data acquisition system



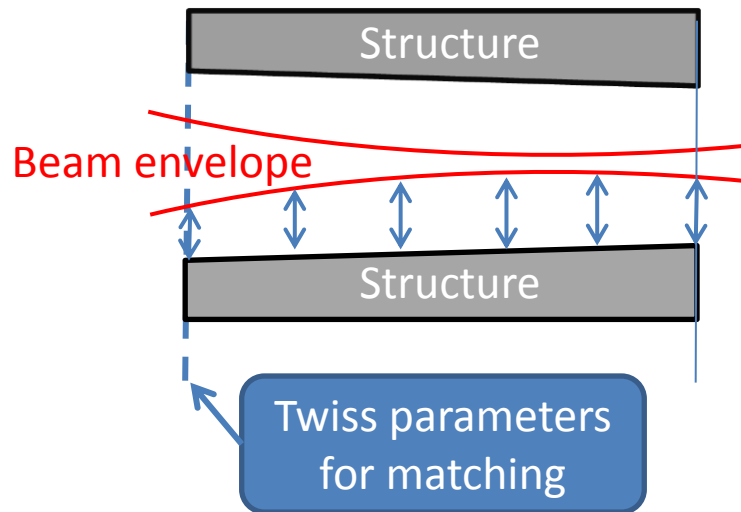
Data acquisition system: A MatLab viewer.



The optic design

Objective: Transport the beam through the linac up to the structure requiring...

- Full transmission efficiency
- Minimum beam size inside the structure



Minimum beam size in average
inside the structure

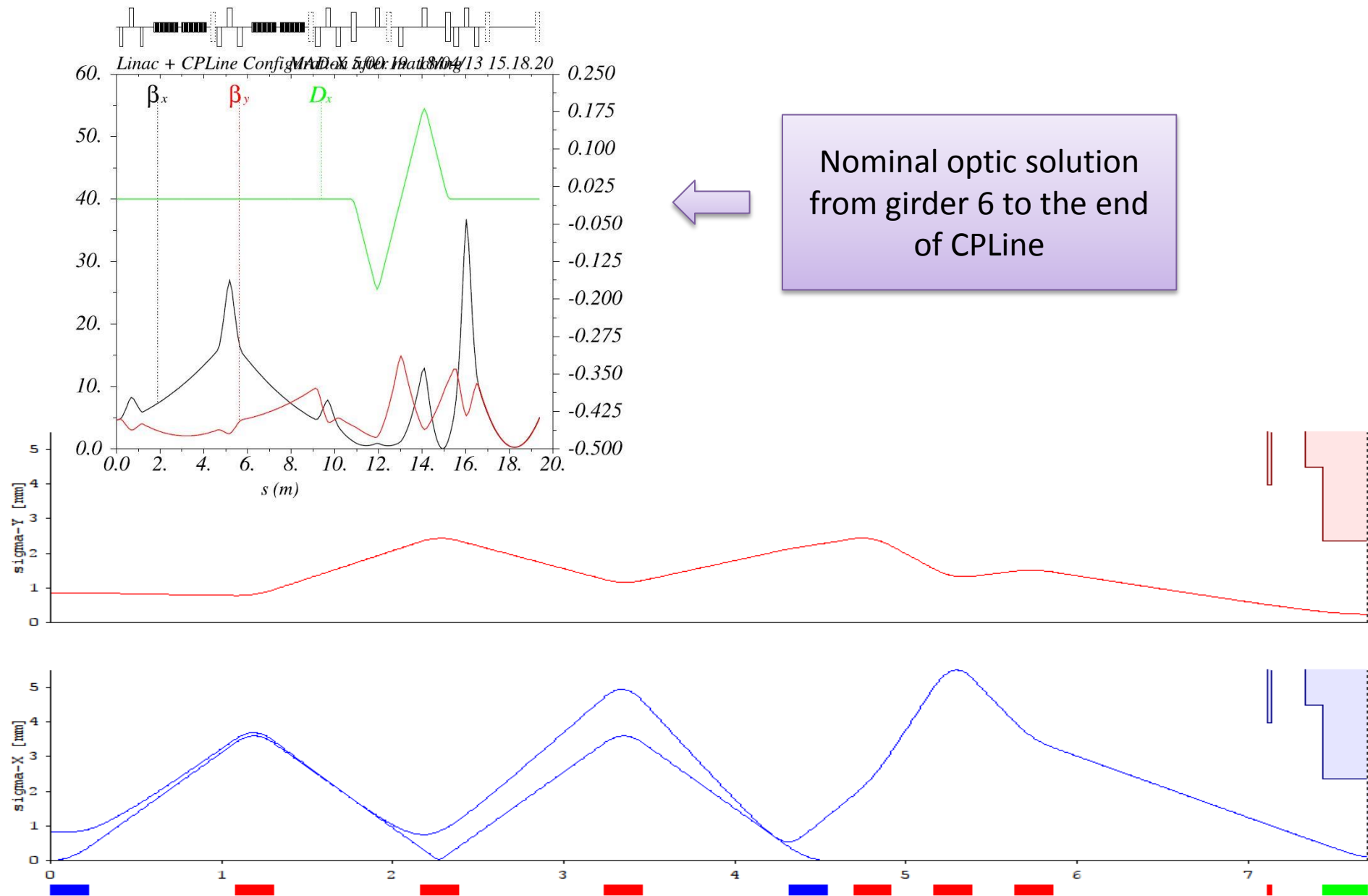


Maximize relative distances
between aperture and beam size
(by M. Dayyani)

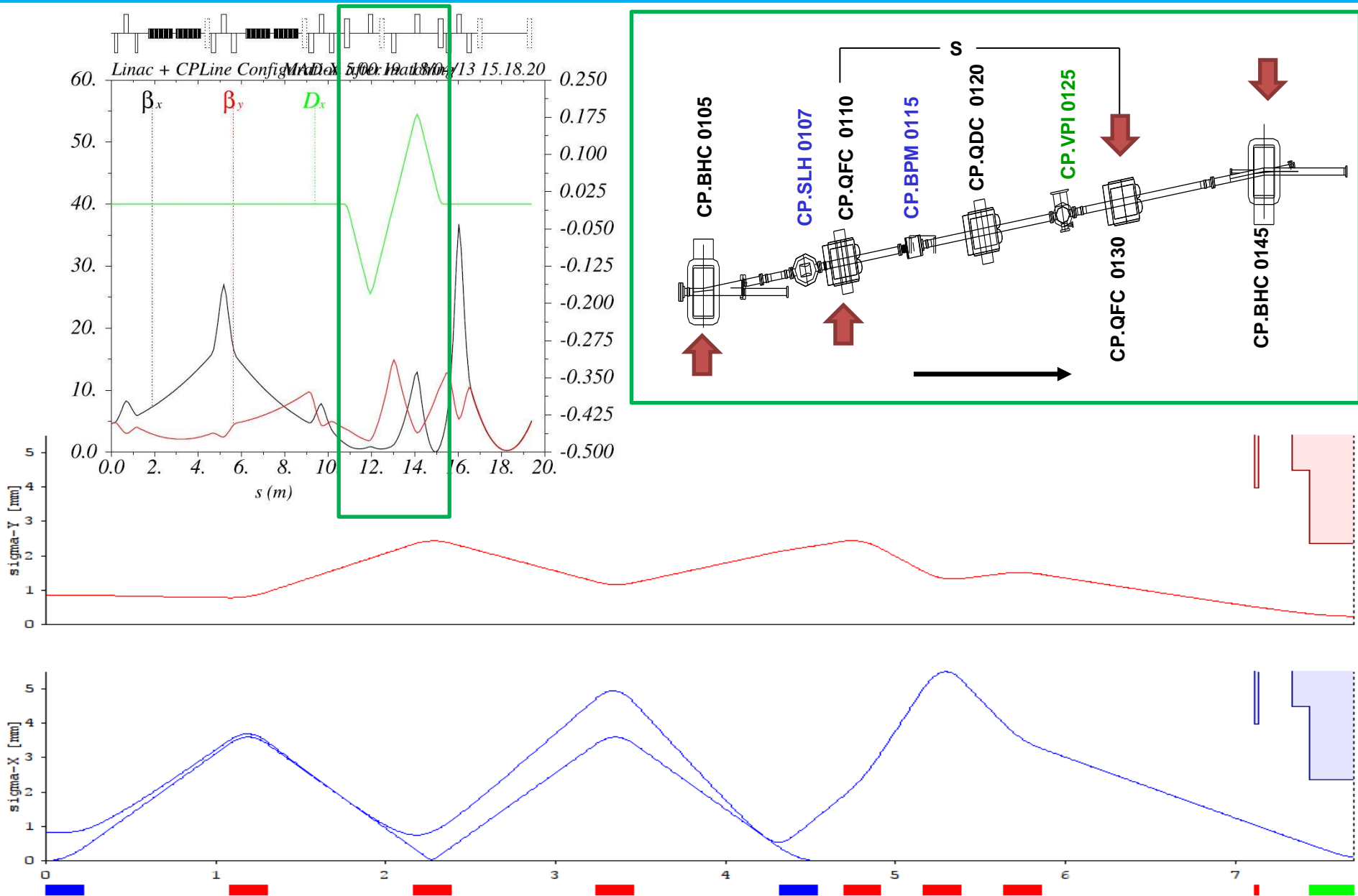
Initial conditions: Nominal Twiss parameters in the linac.

Two optics proposed
Change from GD6 to CPLine
Change from GD8 to CPLine

The optic design: Nominal Optic solution



The optic design: Nominal Optic solution



The optic design: Two possible approaches

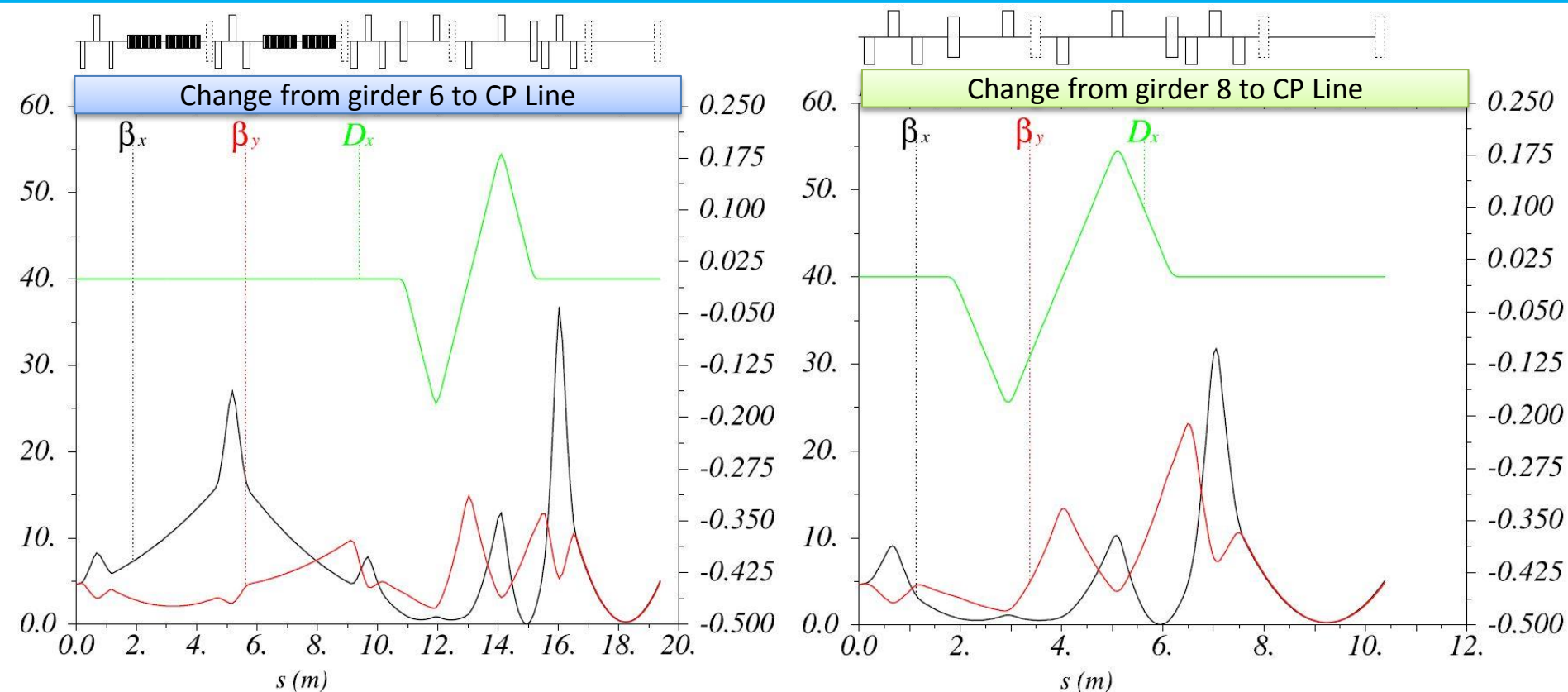
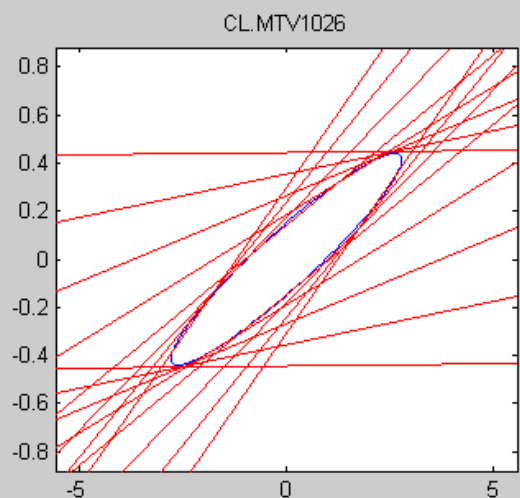


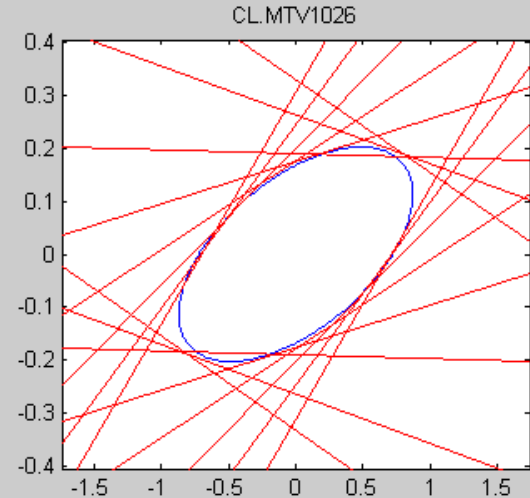
Table of predicted currents for nominal optic at 132 MeV/c in CP Line

	605	610	705	710	805	810	815	110	120	205	210	215
GD6	4.69	4.19	3.49	30.43	7.39	49.33	3.84	70.64	43.51	44.71	88.28	49.64
GD8	4.55	4.19	3.69	29.65	6.25	59.99	7.53	70.64	40.94	52.01	86.10	39.32

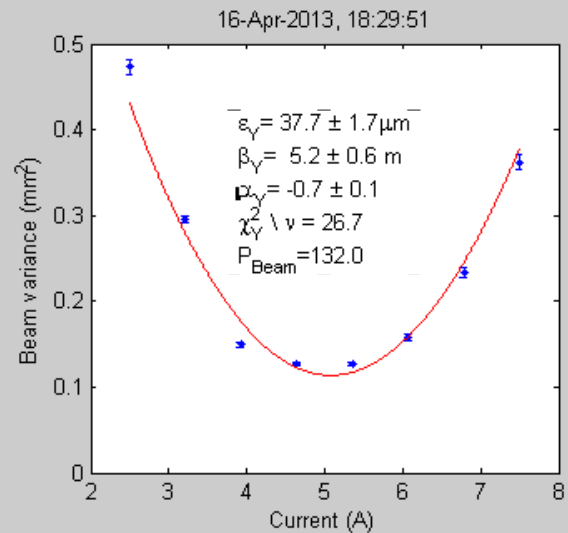
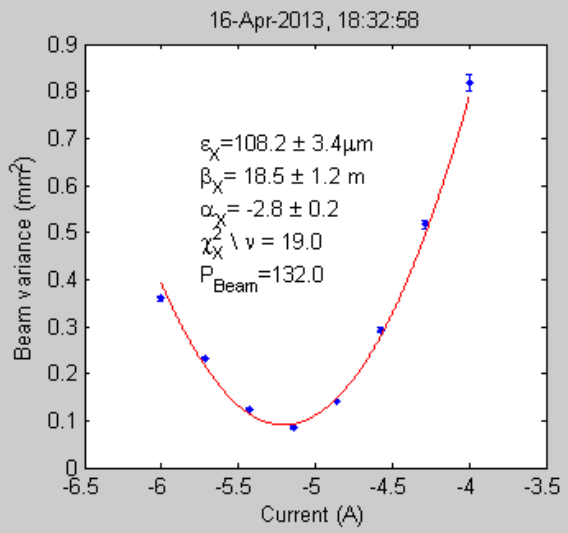
The optic design: Measuring real Twiss parameters



Horizontal parameters



Vertical parameters



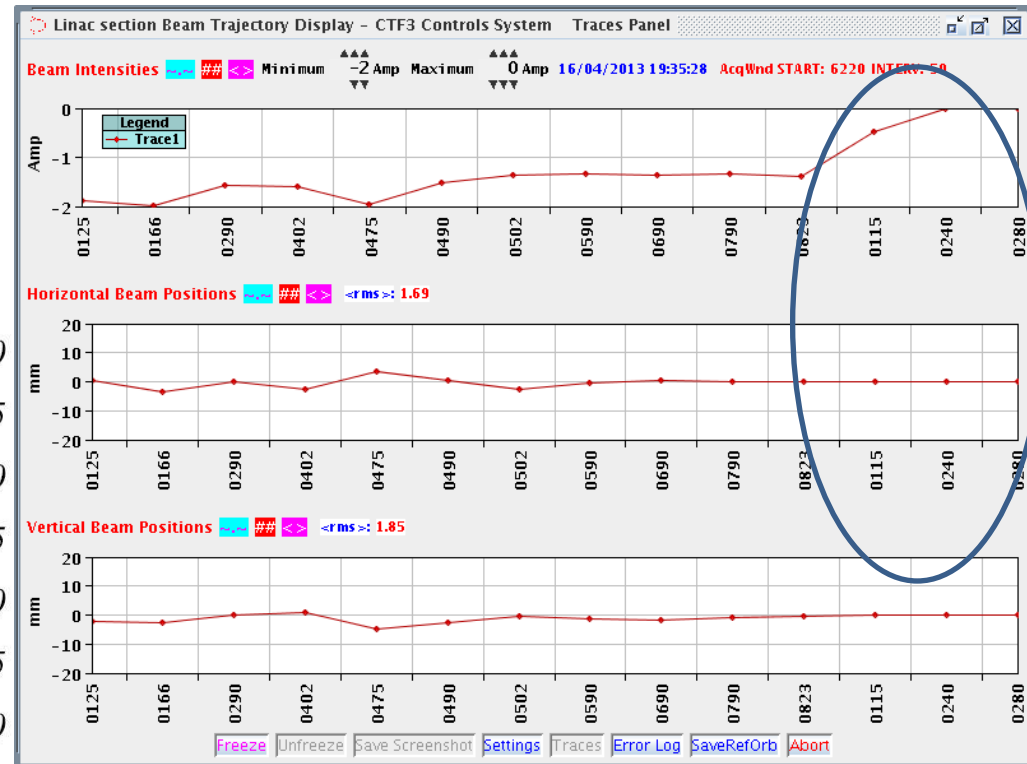
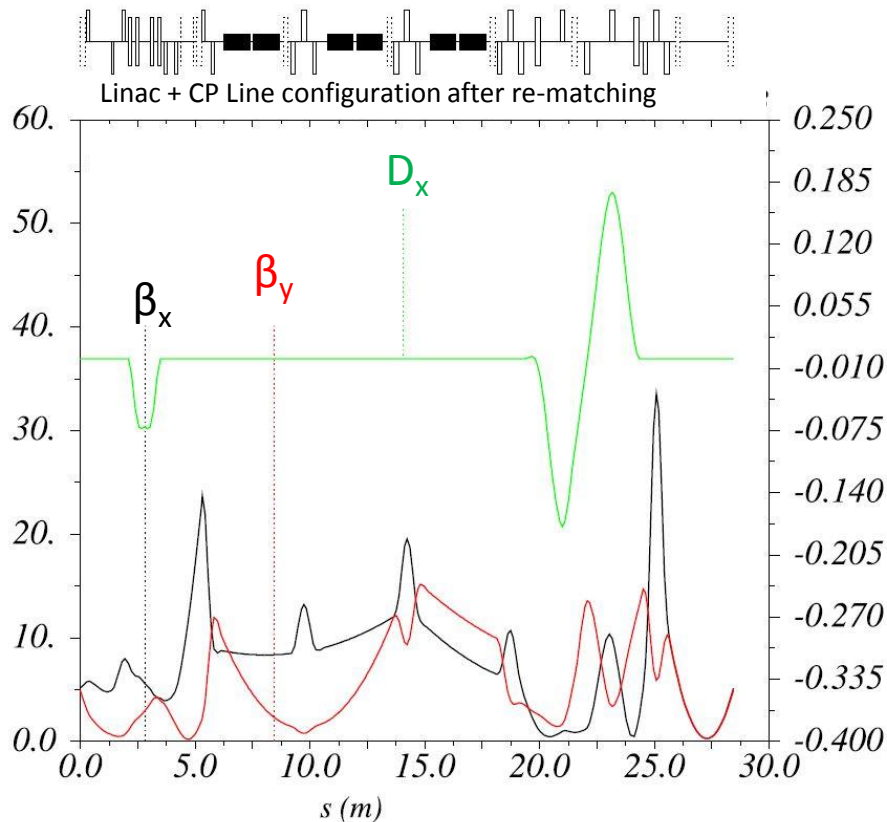
Twiss parameters measured using quad-scan technique in girder 10



Initial conditions for matching nominal optics (next slide)



The optic design: Welcome to the real world

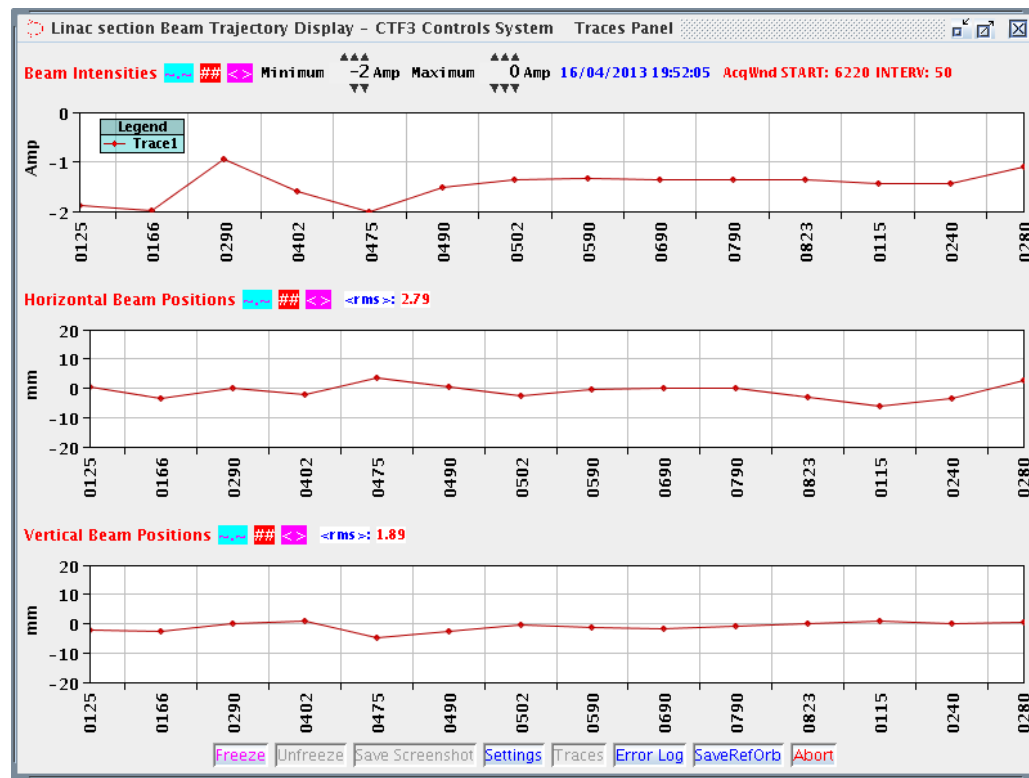
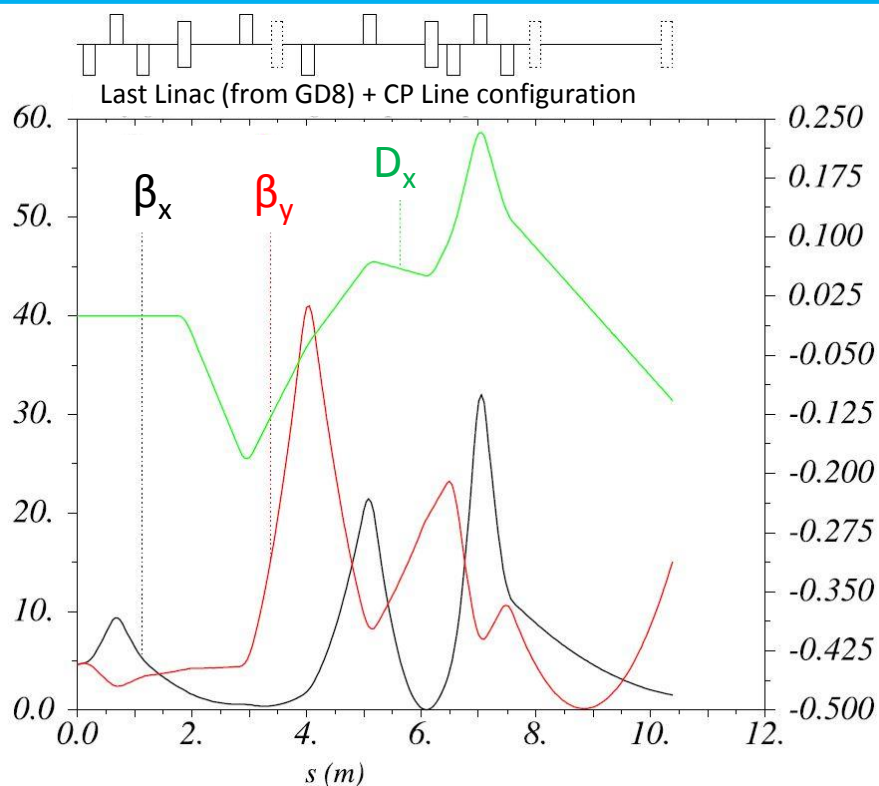


With the matched optics we lose transmission efficiency already at the beginning of the dogleg line.

The 800 quads don't give steering and don't change transmission

The 110 quad has a big influence in the steering

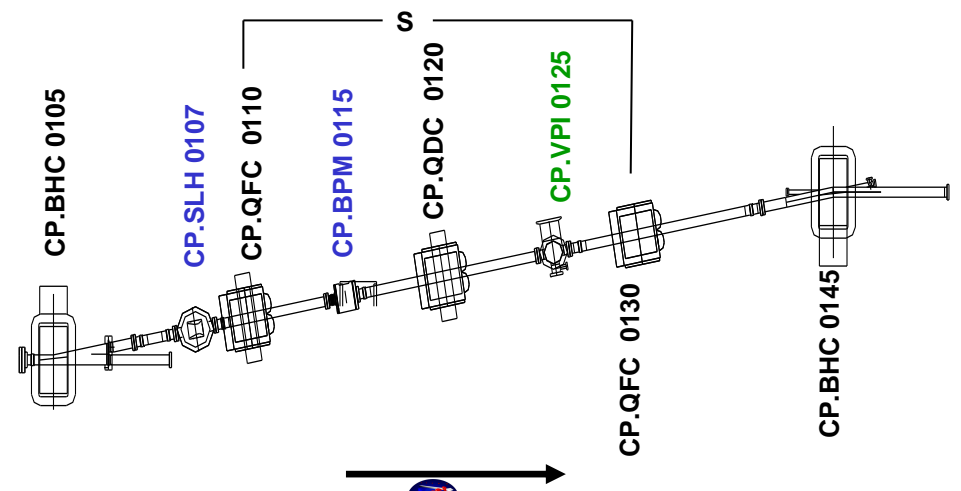
The optic design: Current status



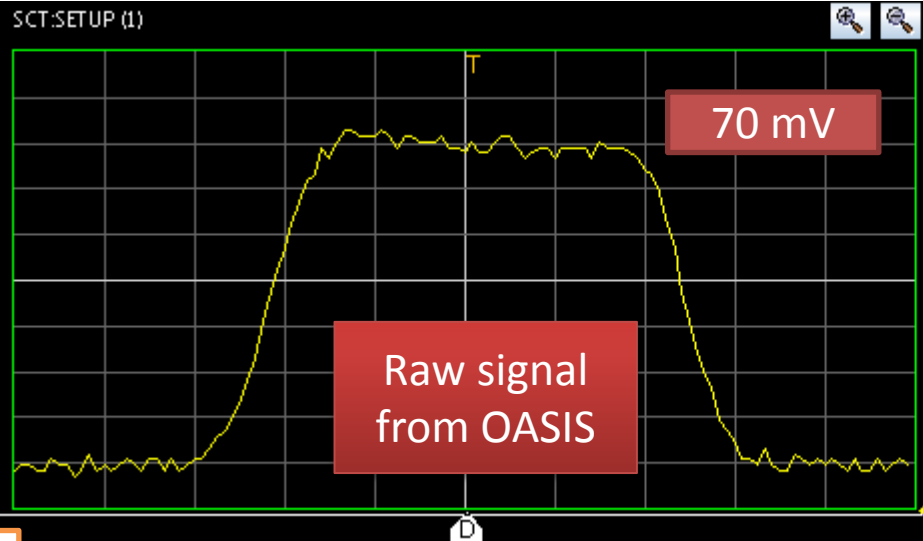
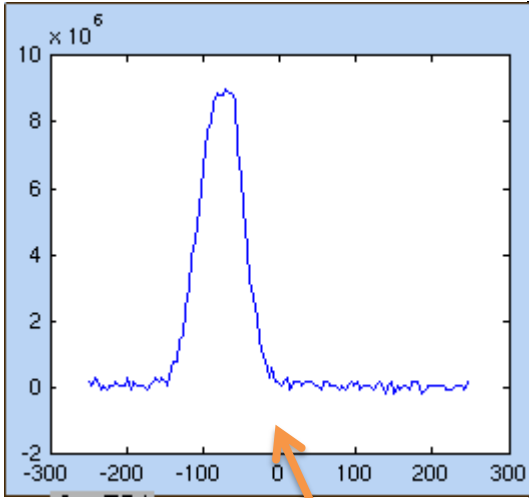
Empirically improving transmission by changing quad 110 (130) and steering...

...spoils dispersion and beam size inside the structure...

... and we have some losses either in the collimator before the structure or inside the structure.

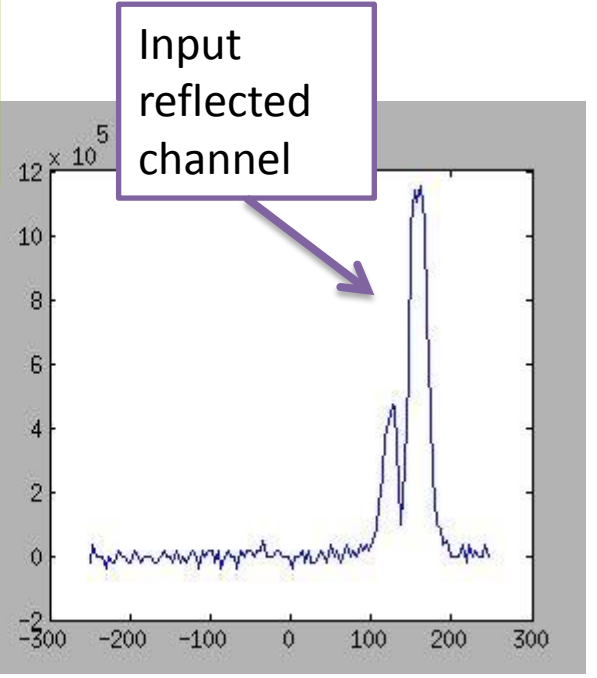
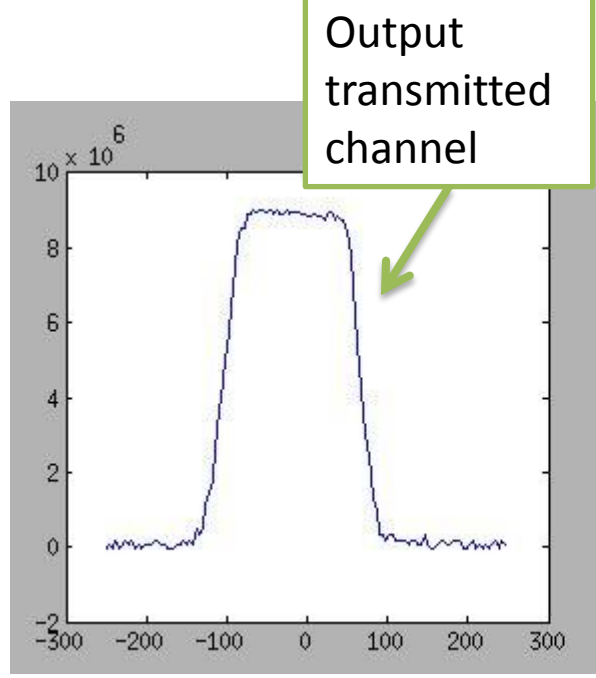
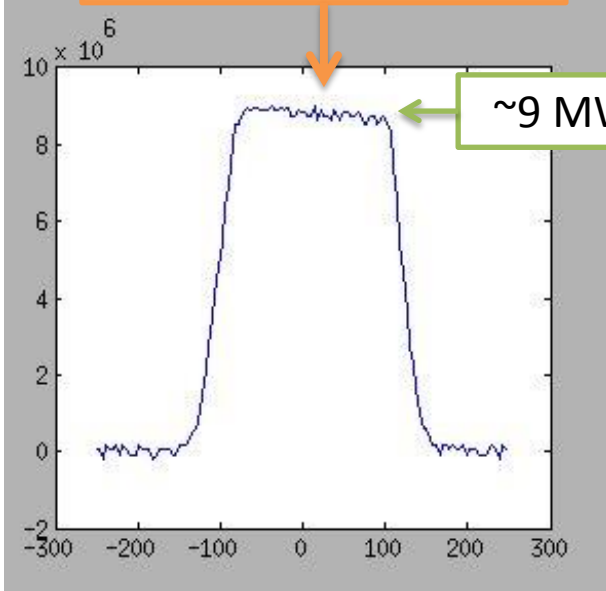


First Results

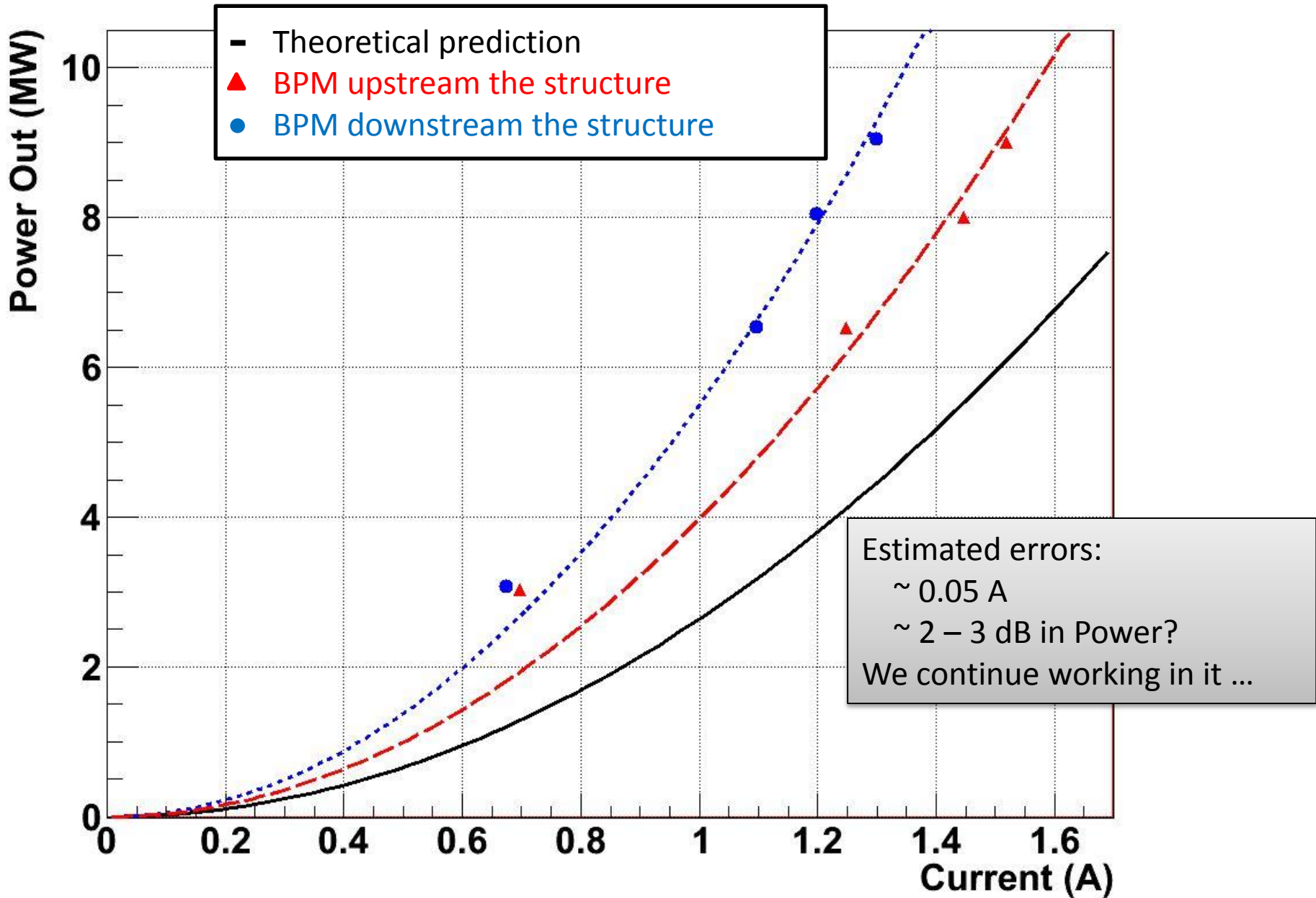


CX.SMEAS_RFX2-TS		ON
NO CLOCK	NO CLOCK	
0	0	
48.0ns/div	0.0s	
1.5V	-	C
CK.SAPTIX01P-AS		
10.0mV/div	21.491mV	
FREE		
Sensitivity	offset	5.8
FREE		
Sensitivity	offset	9.12
FREE		
Sensitivity	offset	13.16

Two different pulses width at ~ 1.3 A



First results: Playing with different currents



Prospects:

- Measure dispersion scaling magnets and/or changing energy
- Test quads/BPM0115 alignment switching on/off the quads
- Reduce energy to gain margin with BHC0145 and DHC0220 (steering)
- Match the optics keeping current dispersion...
- Go through a global calibration?

- Your ideas are welcome!

Work in collaboration with:

M. Dayyani, S. Doebert, A. Grudiev, O. Kononenko, S. Levet, G. Riddone, A. Solodko, I. Syrathev, F. Tecker, W. Wuensch.

Thanks to:

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Backup

