Circumference Lengthening

03/11/15 measurements

V. Ptitsyn, S. Brooks, Y. Hao,

A. Marusic, G. Robert-Demolaize,

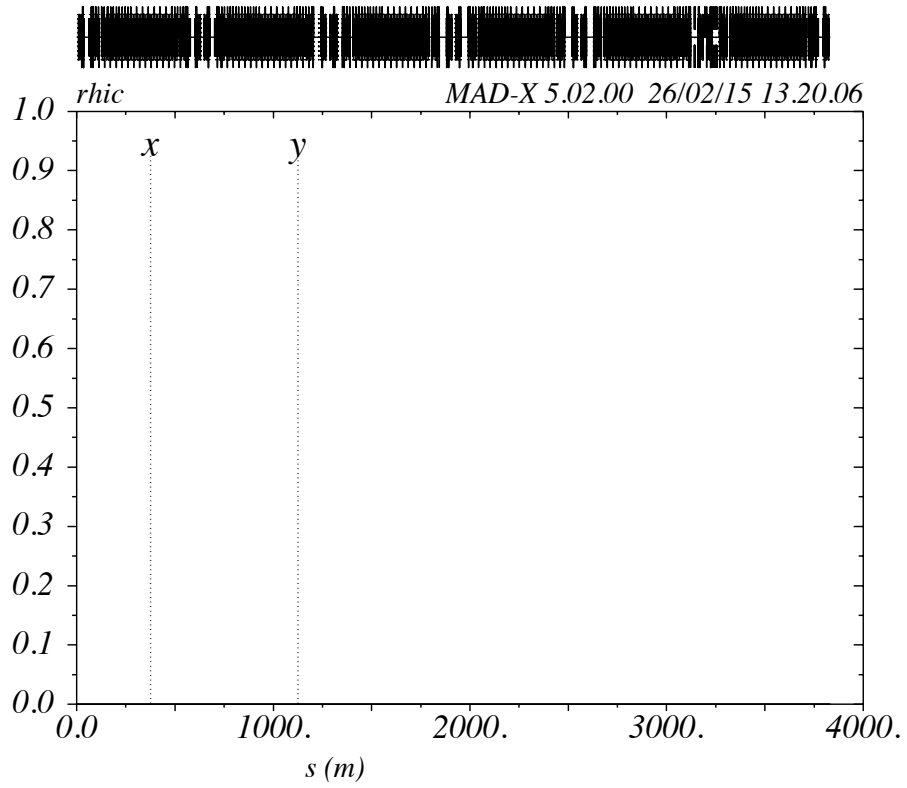
D. Trbojevic

03/11/15 study

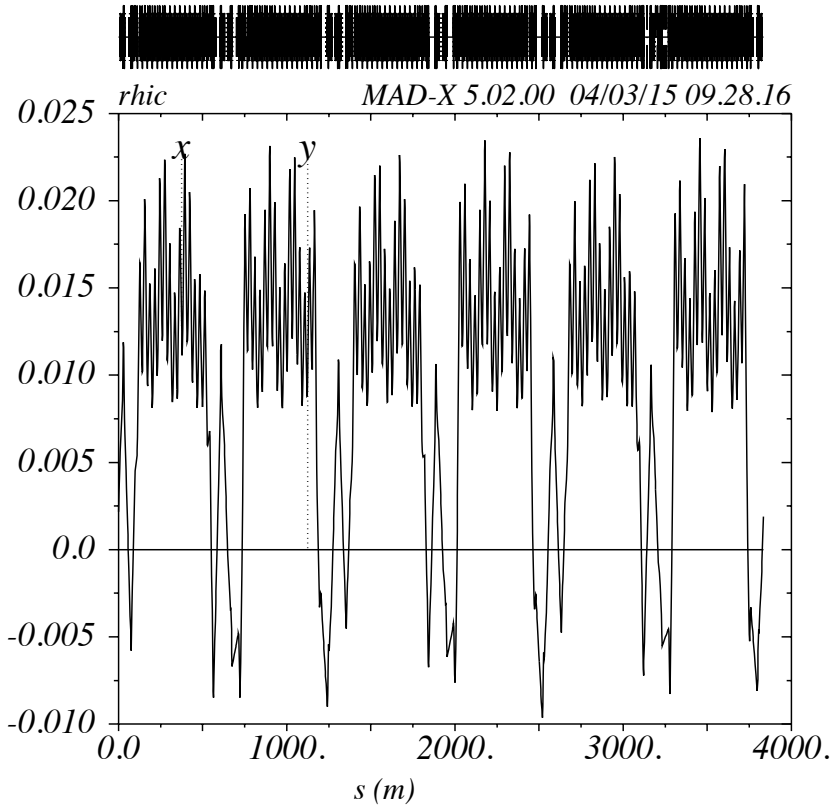
- Started ~20min later, but then got additional half hour. ~2h for whole study.
- Measurements were done at the injection
- Dedicated ramp was prepared by Guillaume and Al to change all quadrupole strength proportionally to momentum change.
- The goal was to verify the ramp operation.
- Used momentum change dp/p up to 0.005 (radial shift ~ 6mm in arc)

Radial orbit

regular lattice, $\Delta p/p=0$

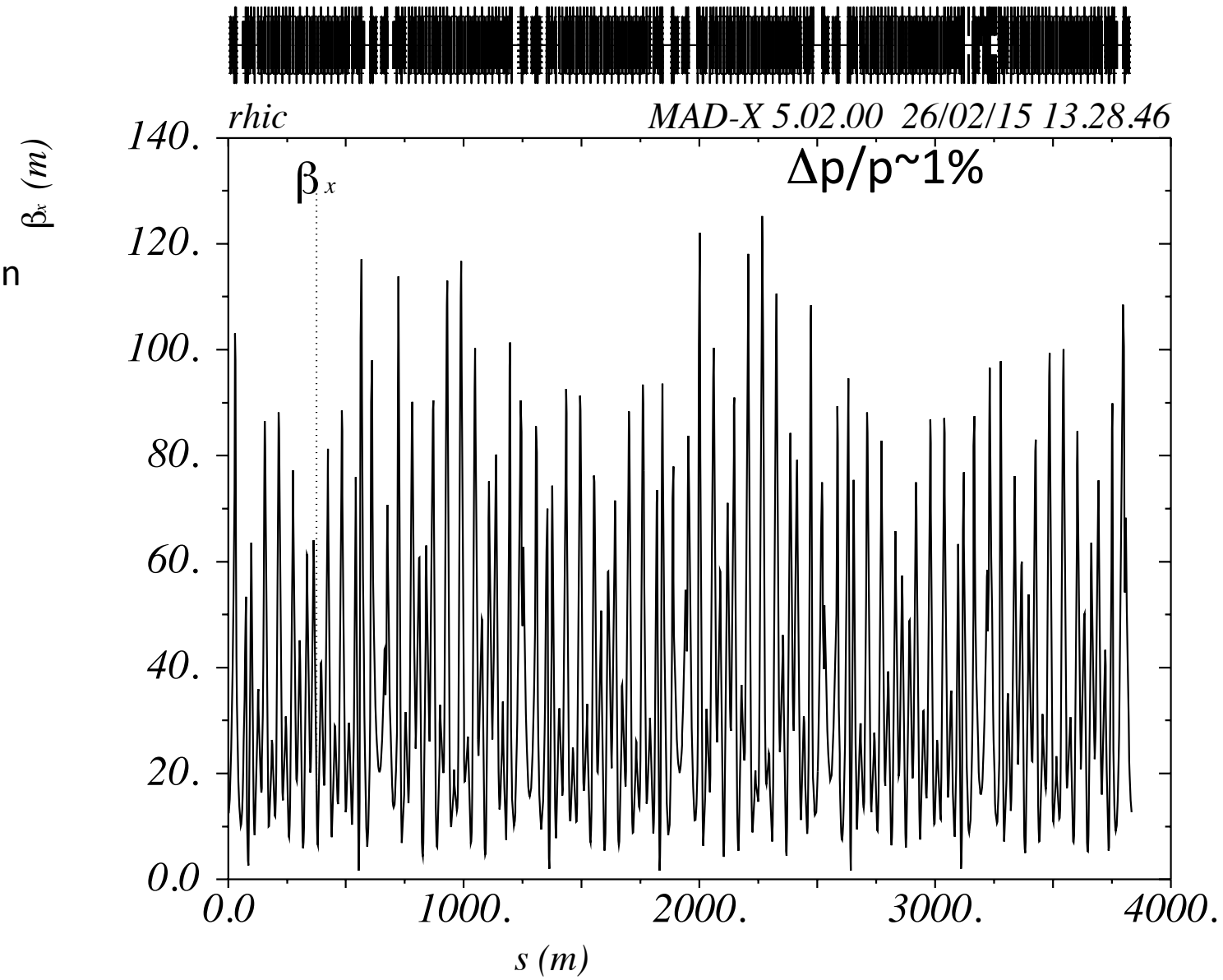


optimized lattice, $\Delta p/p=0.01$



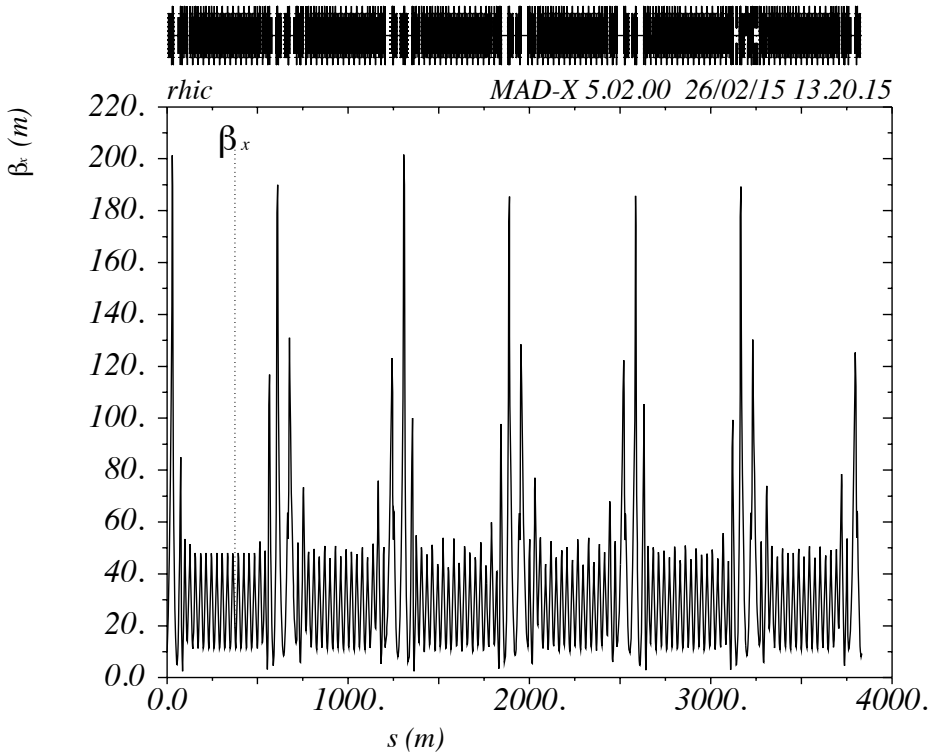
Horiz. beta-function

regular lattice,
Δp/p=0.01

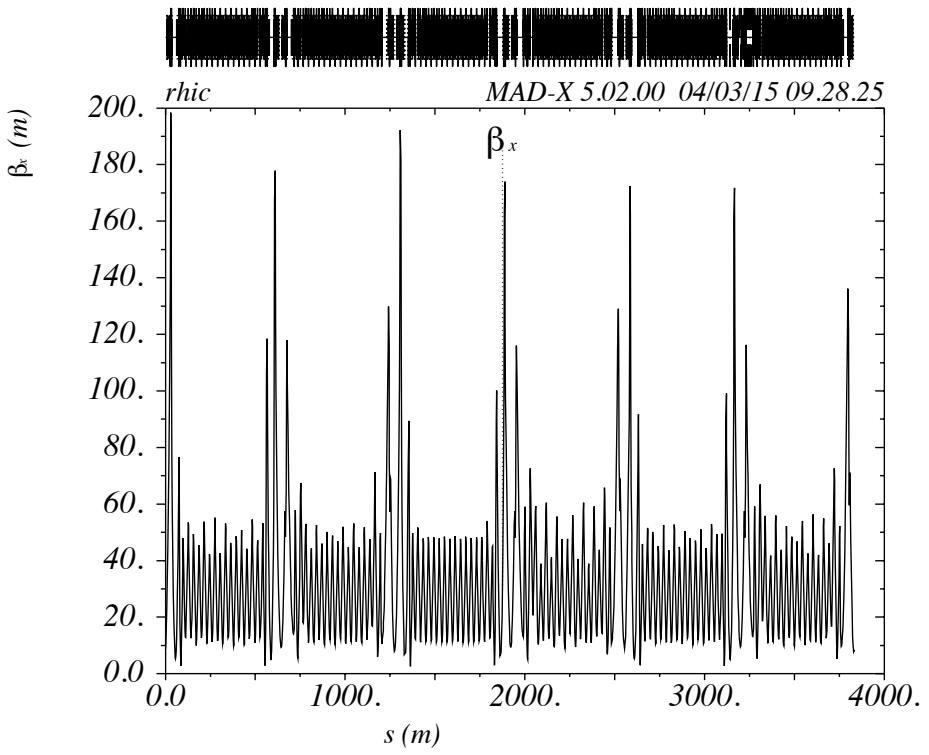


Horizontal beta function

regular lattice, $\Delta p/p=0$

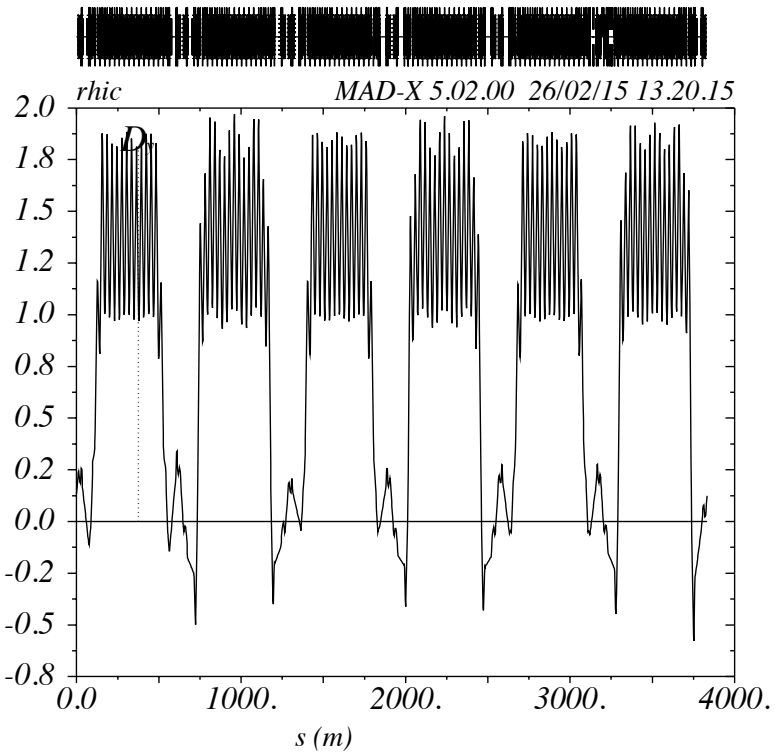


optimized lattice, $\Delta p/p=0.01$

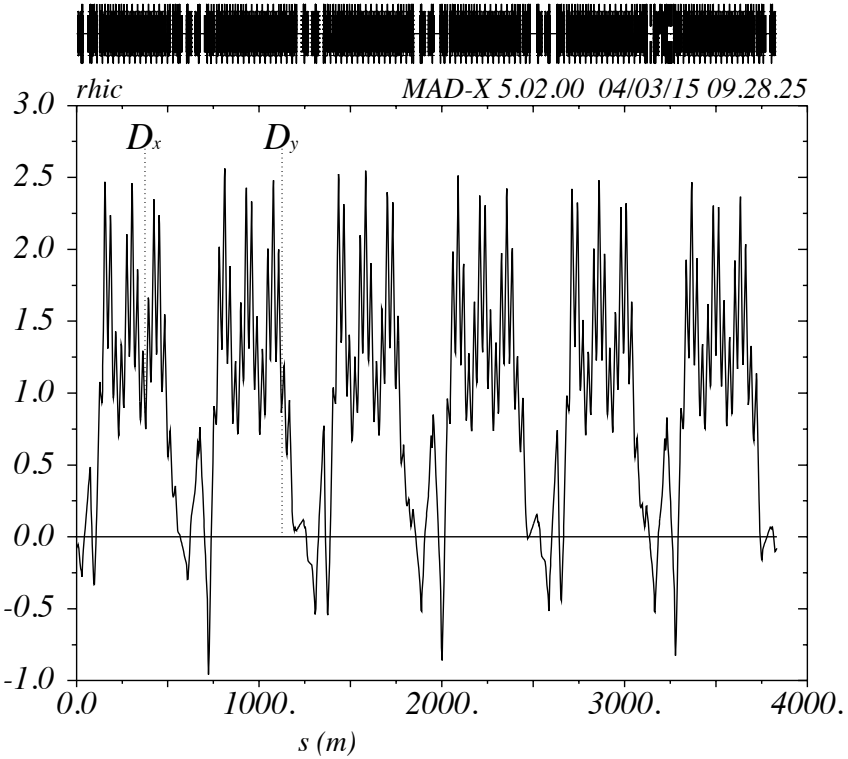


Dispersion function

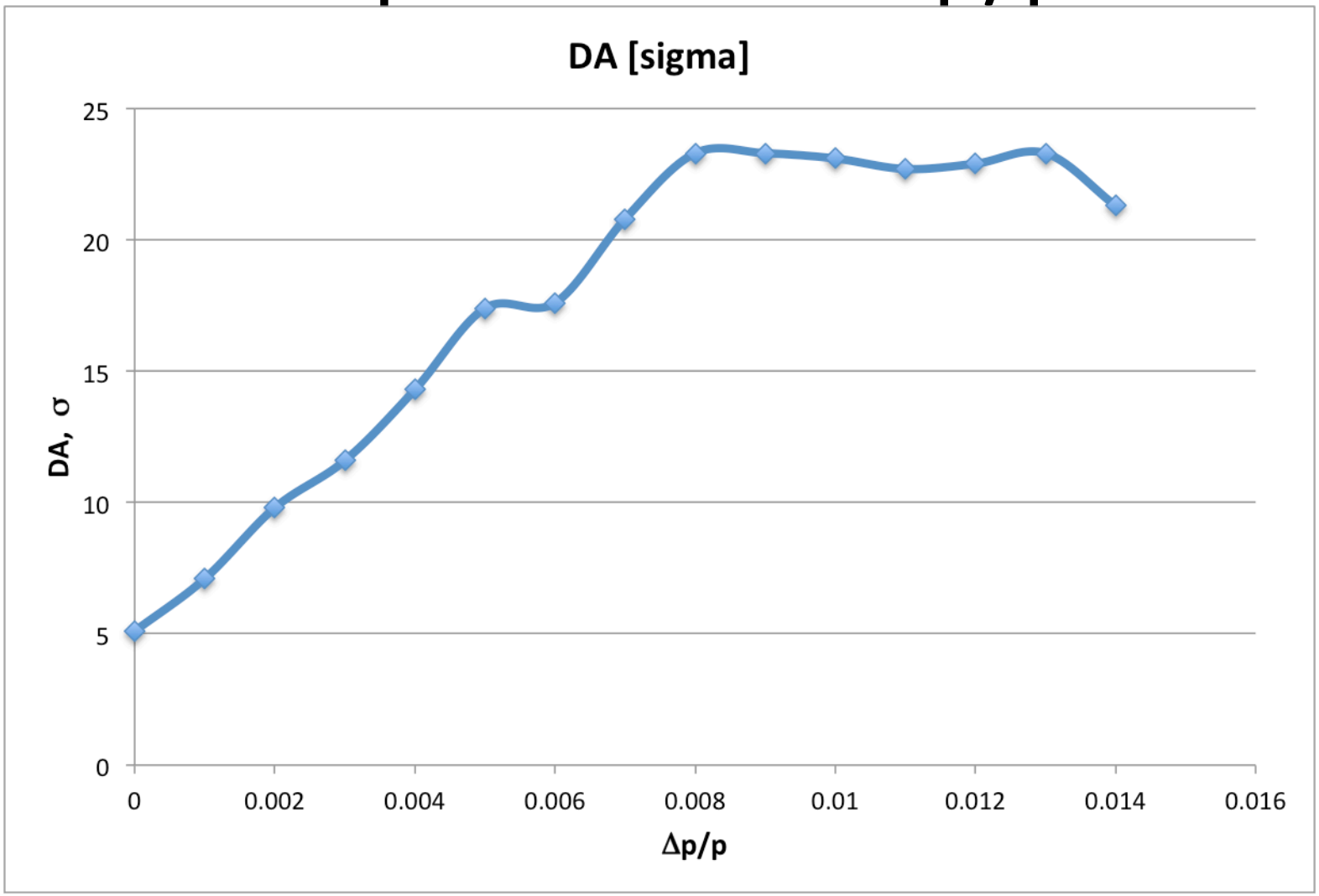
regular lattice, $\Delta p/p=0$



optimized lattice, $\Delta p/p=0.01$



DA evaluation for the lattice optimized for dp/p=0.01

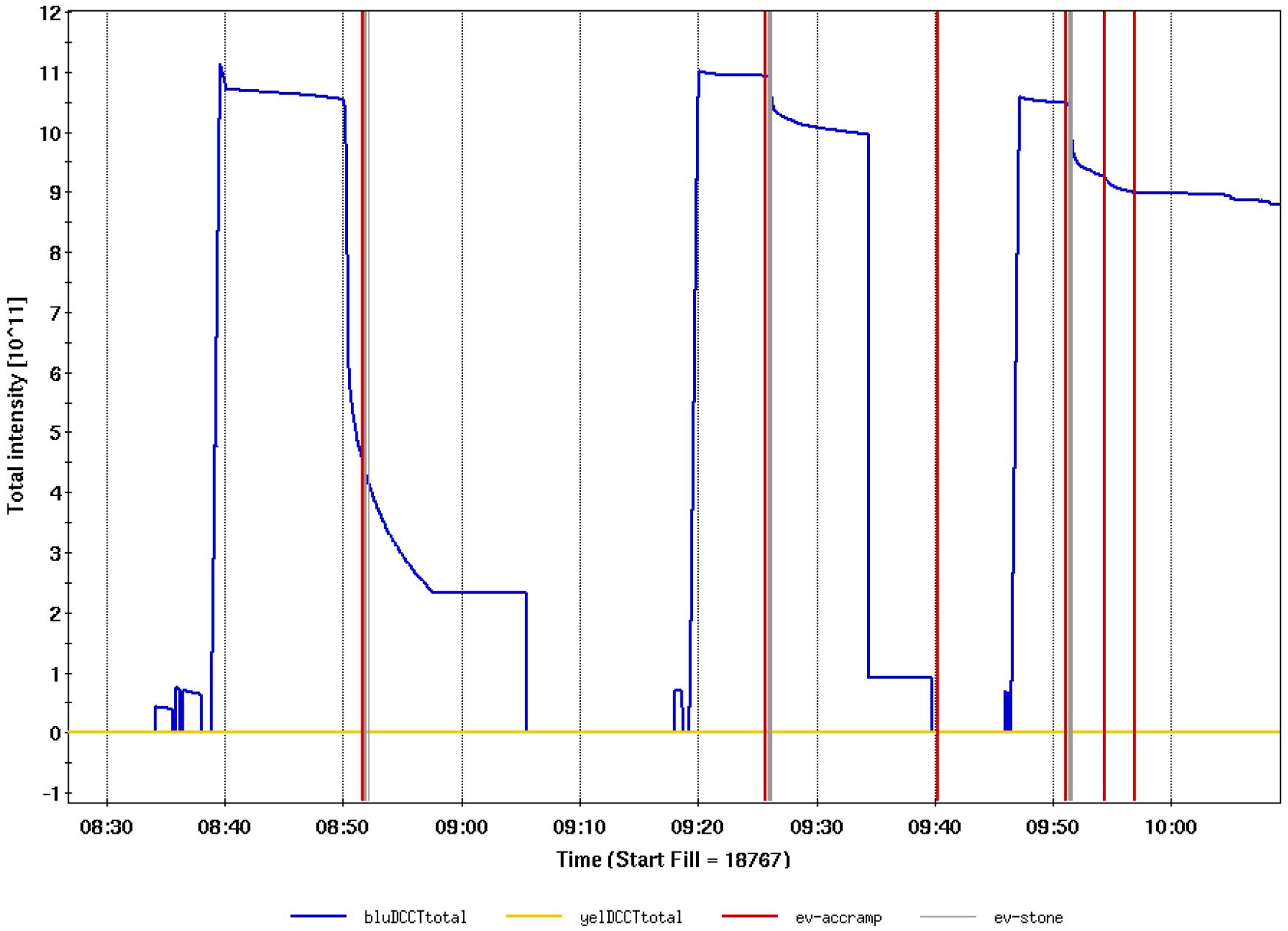


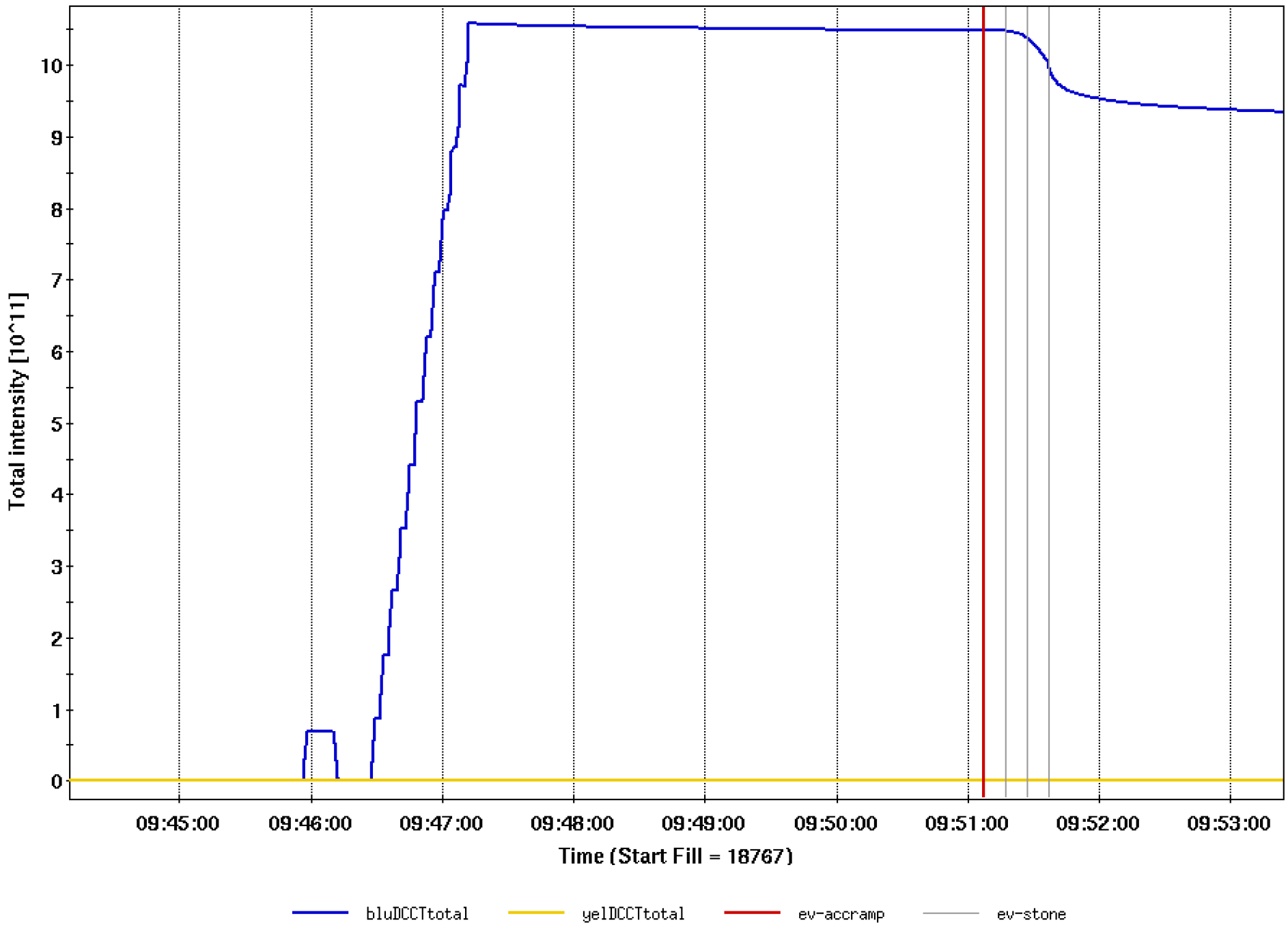
Y. Luo

Dedicated Ramp

Ramp adjustments

- Octupole were switched off.
- Sextupole settings were used on the base of MAD model prediction (but without dipole magnet sextupole contribution)
- RF frequency and magnet ramp was completely synchronized. Duration 30 sec.
- Found problems: quad adjustment limits during tune feedback and automatic disengagement of the tune feedback at the store.
- Measured and corrected chromaticity at the store stone.


Total intensity [10^11]
12
11
10
9
8
7
6
5
4
3
2
1
0
-1
08:30
08:40
08:50
09:00
09:10
09:20
09:30
09:40
09:50
10:00
Time (Start Fill = 18767)
bluDCCTtotal
yelDCCTtotal
ev-accramp
ev-stone


Total intensity [10^11]
0
1
2
3
4
5
6
7
8
9
10
09:45:00
09:46:00
09:47:00
09:48:00
09:49:00
09:50:00
09:51:00
09:52:00
09:53:00
Time (Start Fill = 18767)
bluDCCTtotal
yelDCCTtotal
ev-accramp
ev-stone

Further plan

- Having the ramp machinery tested at last studies, go to full ramp with momentum change up to 1%. (Prepare also the ramp for -1% momentum change)
- Include dipole magnet contribution to sextupole field to calculate more accurate QF,QD, SF,SD settings for the ramp.