



ELENA commissioning

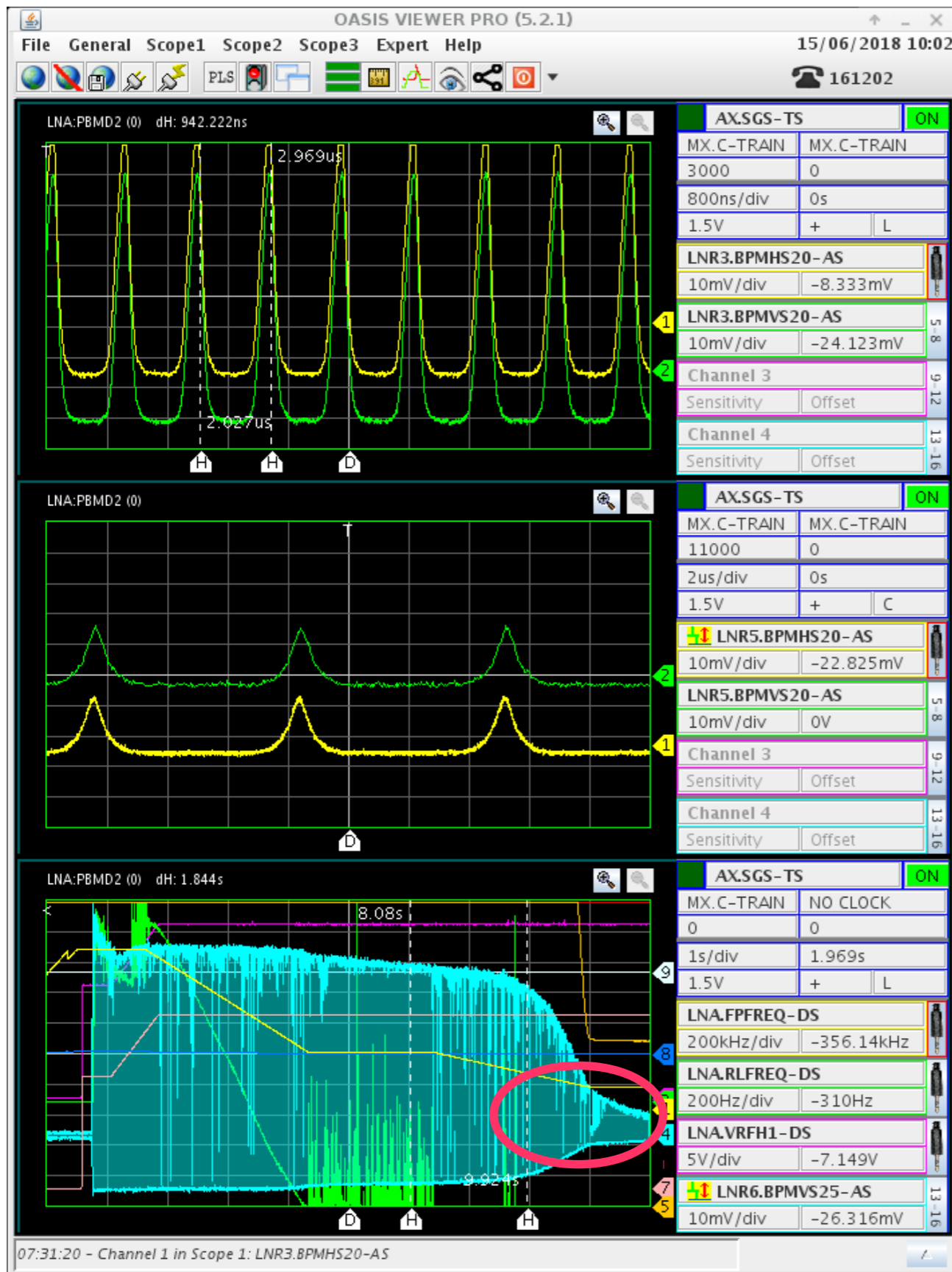


ELENA cycle optimization



- Optimization of the cycle without e-cool magnetic system:
 - E-cool magnetic system switched ON and effect corrected for test
- Systematic Injection oscillations correction
- Tune and coupling adjusted on each plateau (including intermediate plateau added along the ramps)
 - 2 intermediate points in the first ramp and 1 added in the second ramp
- Increased by +1s both ramp lengths and longer rounding (210ms instead of 10ms) on second ramp
- Orbit corrected on the 3 plateau and tentatively along the second ramp (can be improved)
- Optimization of LLRF, debunching-rebunching → see Davide's slides

Where we are with pbar

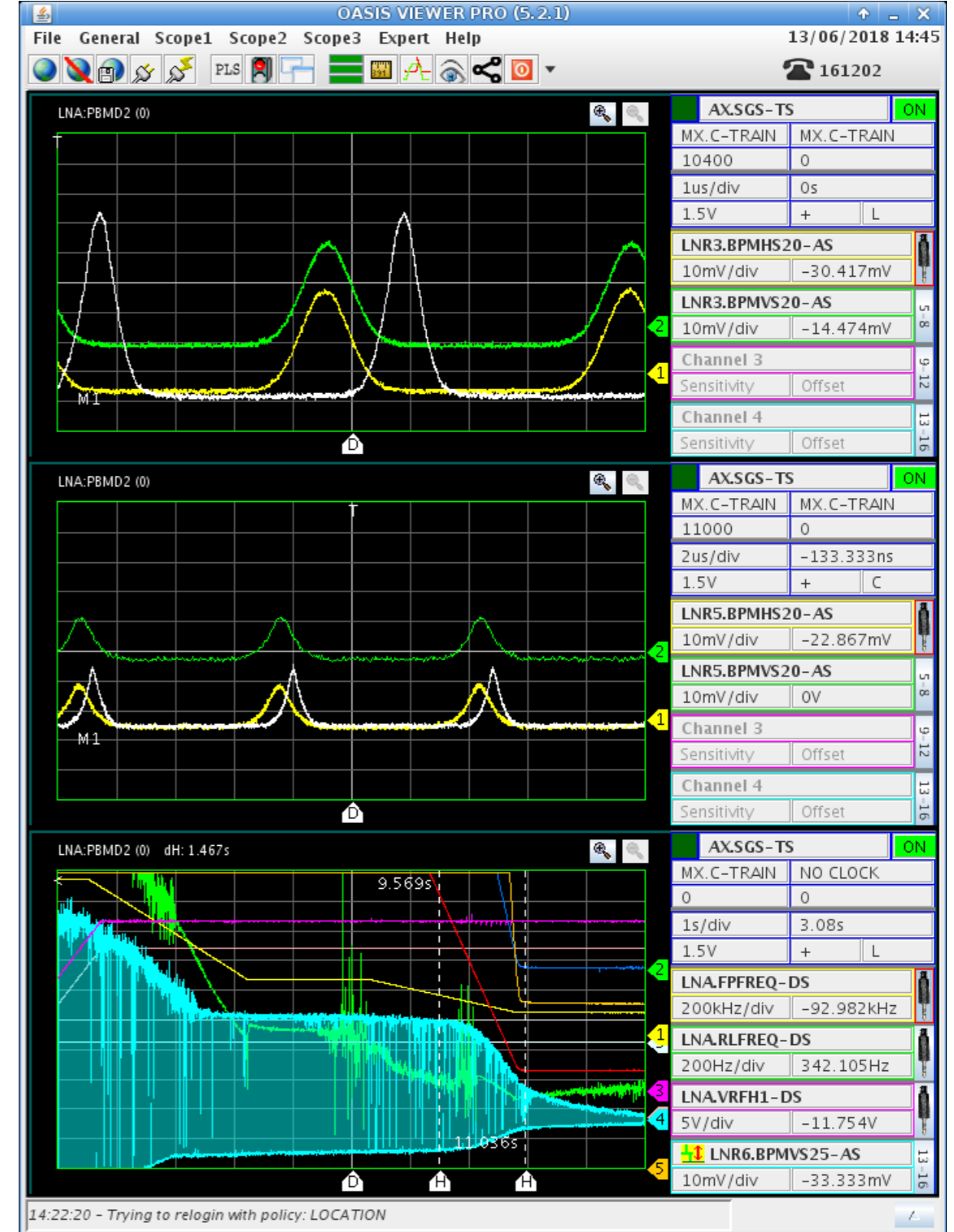
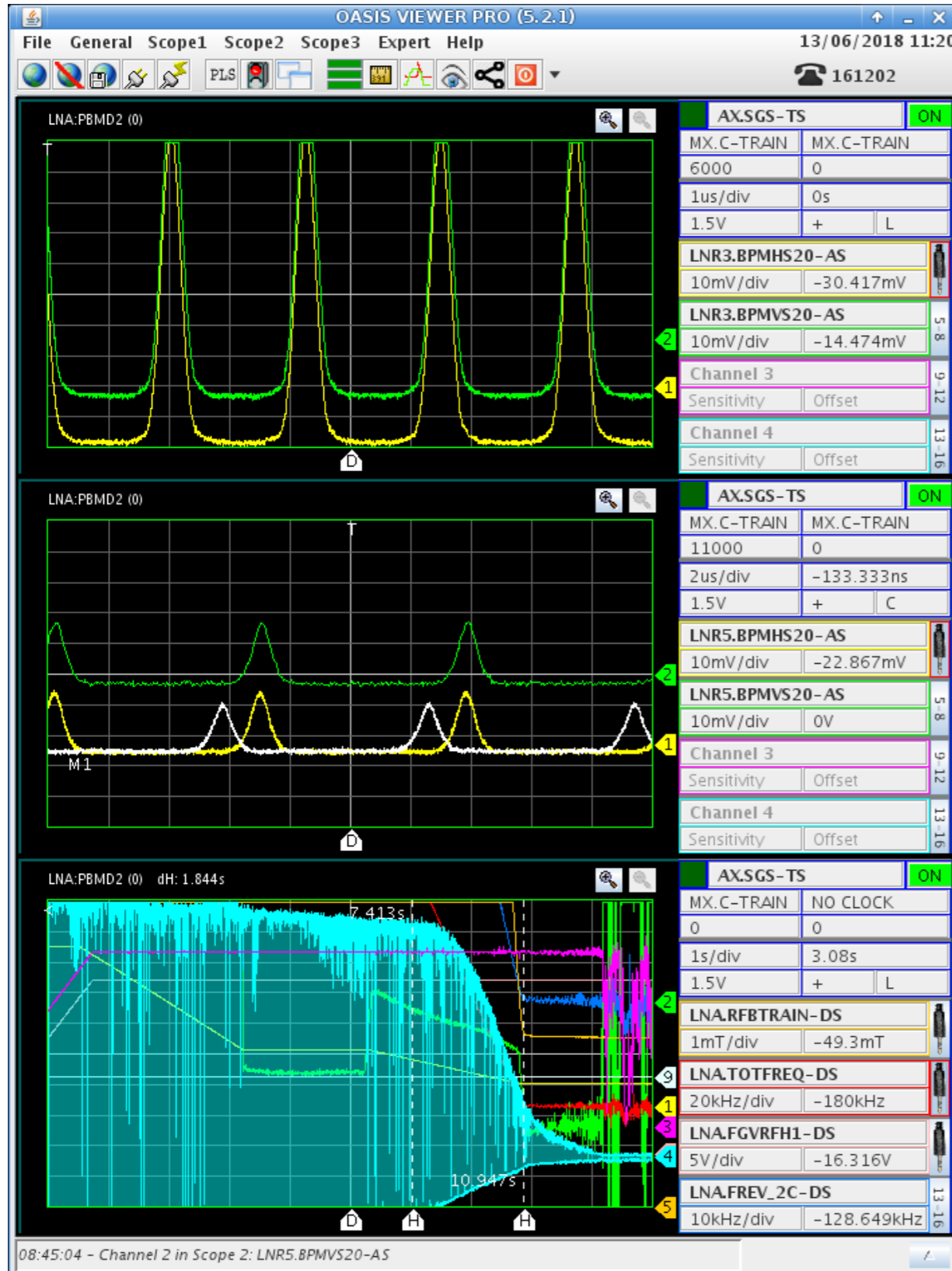


- Pbar reaching last plateau
- Losses starting in the middle of second ramp
- Tune adjusted to $\sim 2.41/1.45$ along the cycle
- Coupling minimized using skew quadrupoles:
 - Strength needed increasing with Momentum decreasing
- Orbit corrected along the cycle

Reproducibility

From Wed 13/06

Not optimized injection matching





Tune measurement

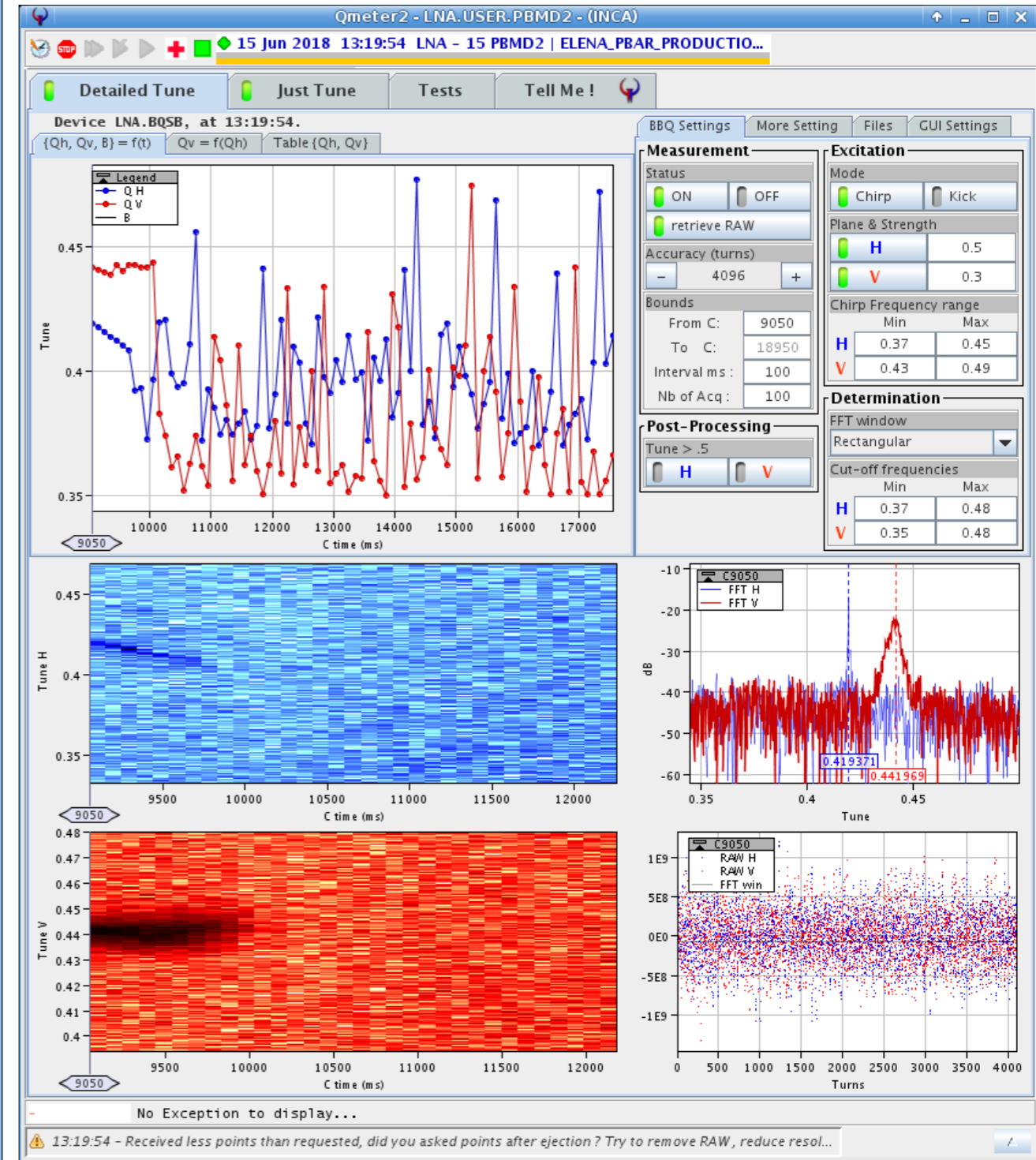
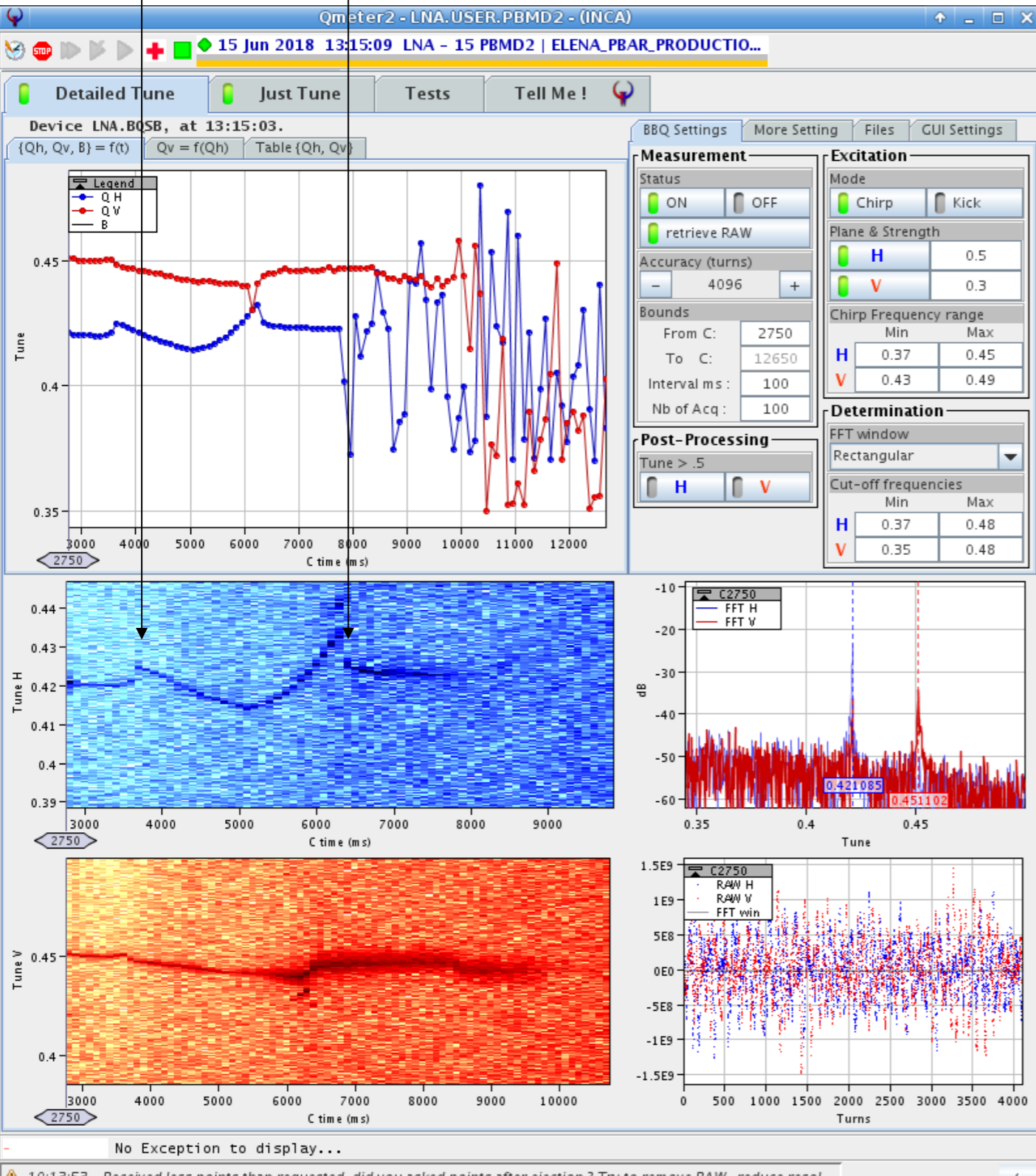


First ramp

First ramp starts at C=3600 to C=6300

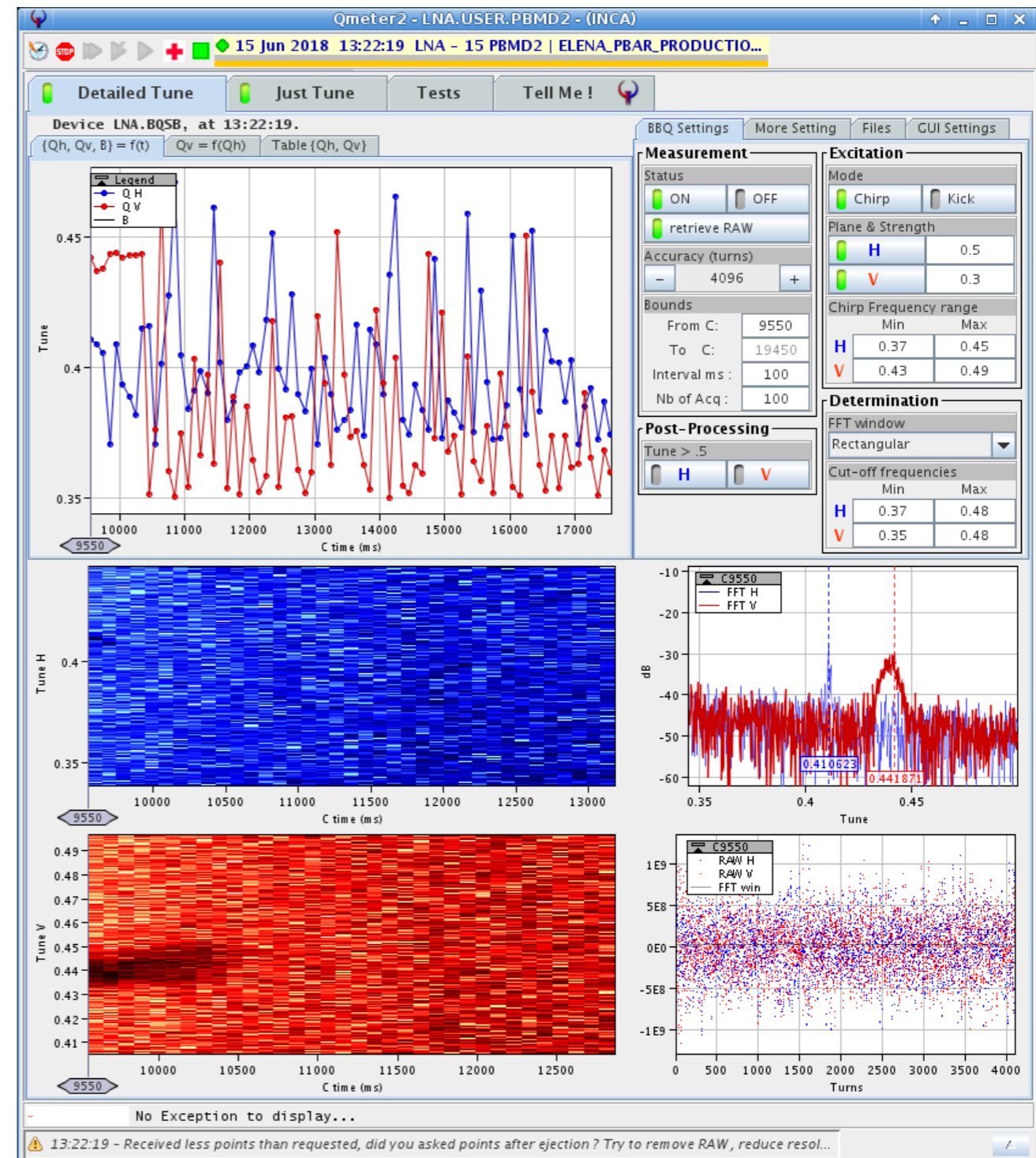
Second ramp from C=8400 to C=11000

Beginning of 2nd ramp



Beginning of 2nd ramp

- Tune measurement quality OK till intermediate plateau
- more tricky along the second ramp (intensity related?)
- Discrepancy between measured tune values and programmed one increasing with momentum decreasing:
 - Cannot adjust tune values with the QH/QV parameters on last plateau
 - Need to change directly currents in Quad families



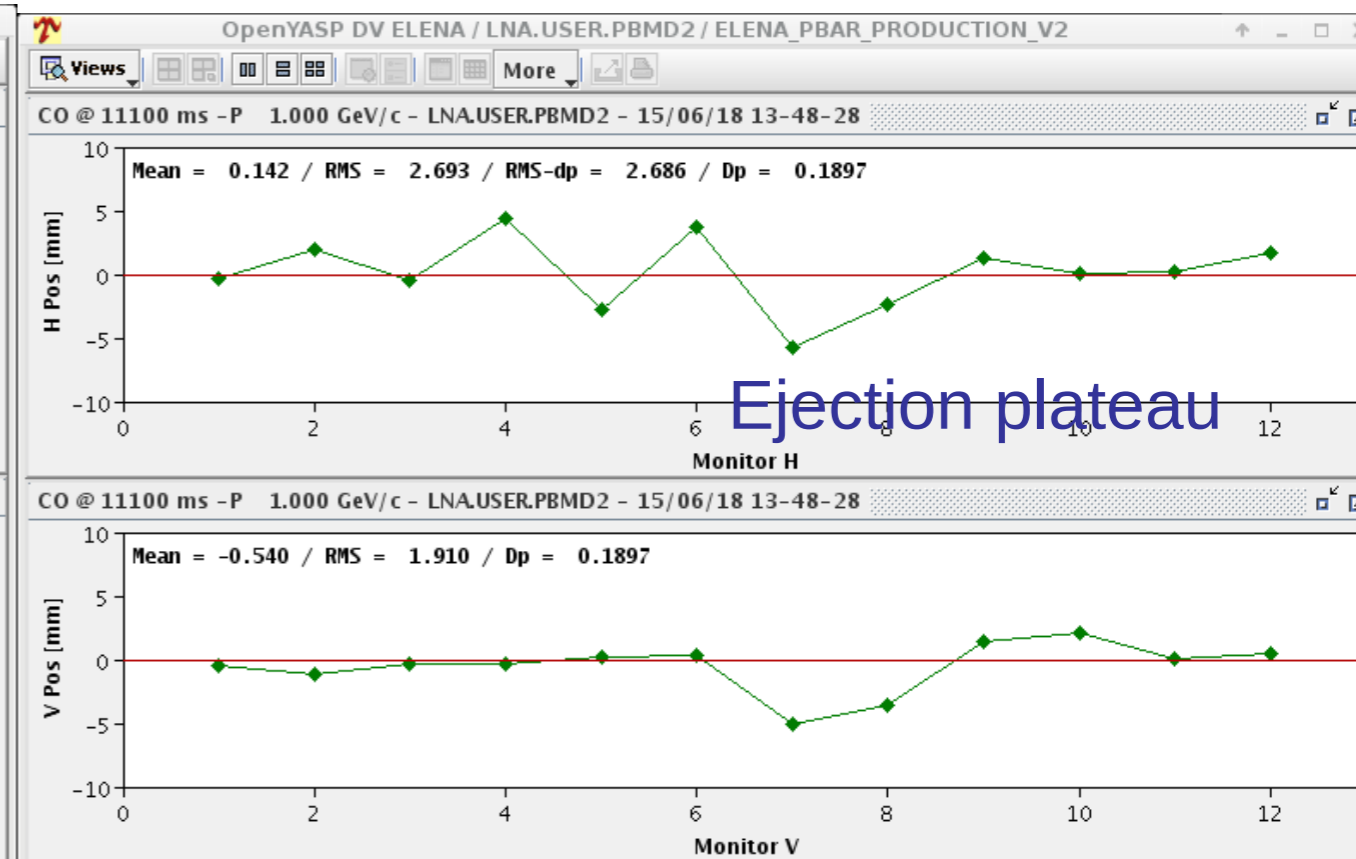
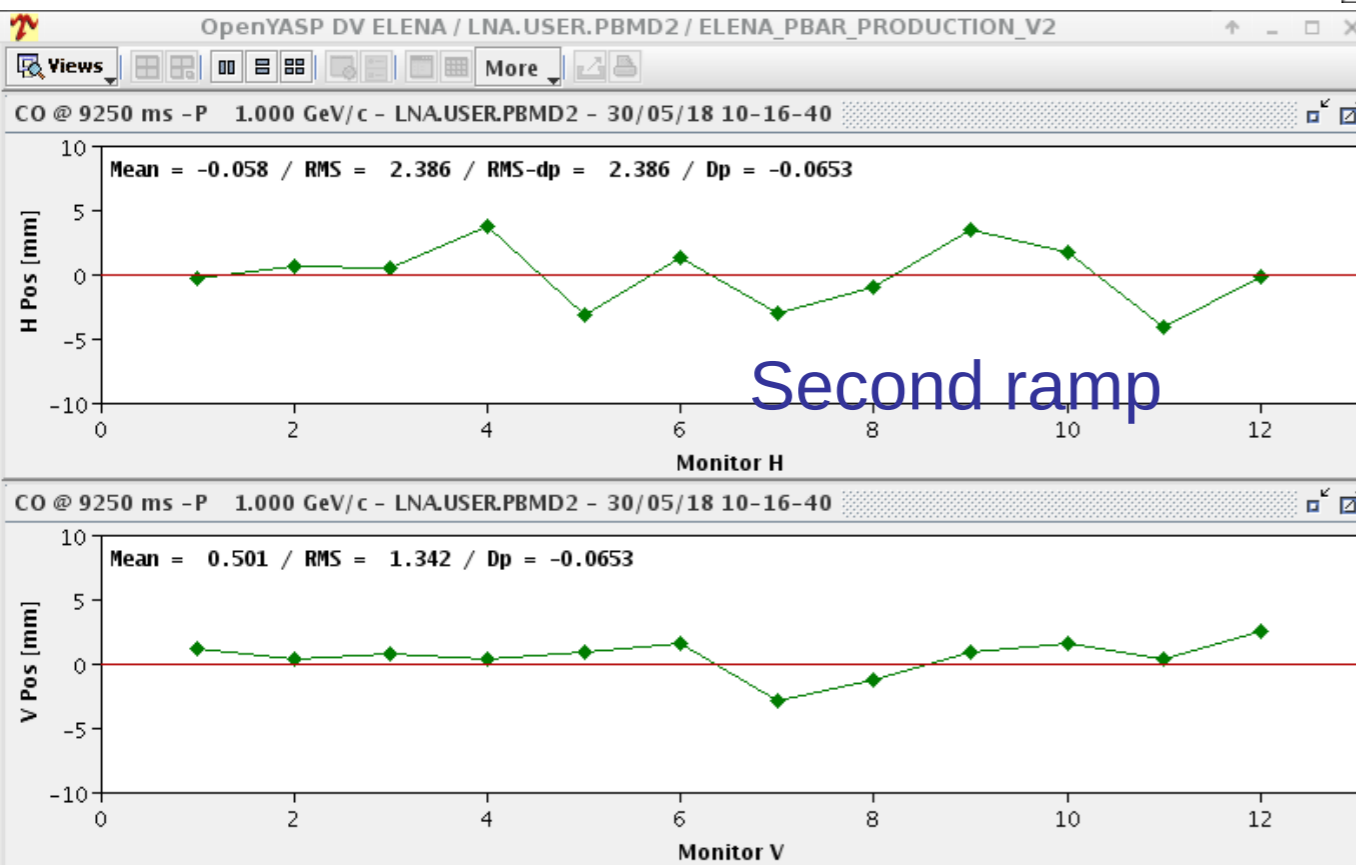
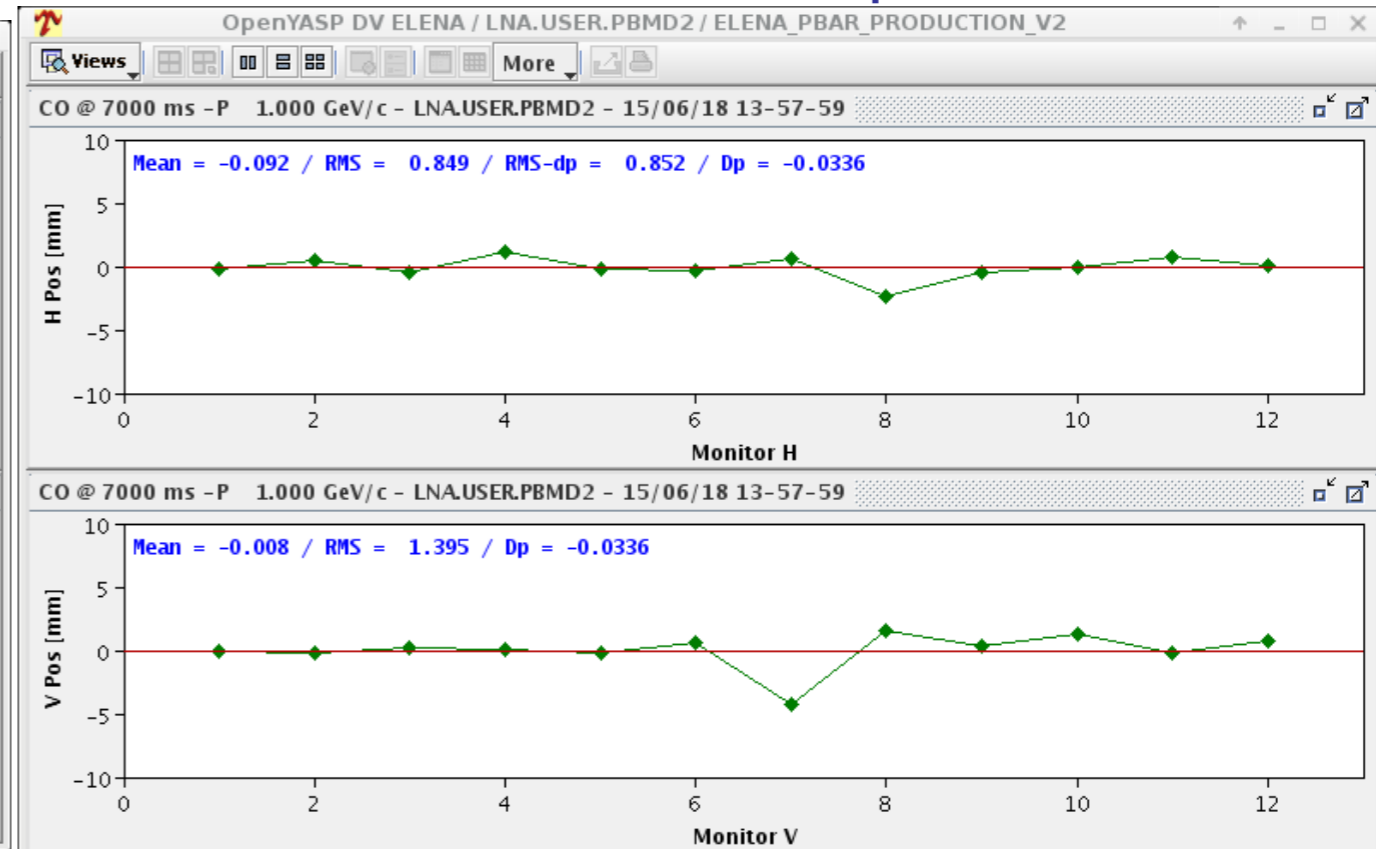
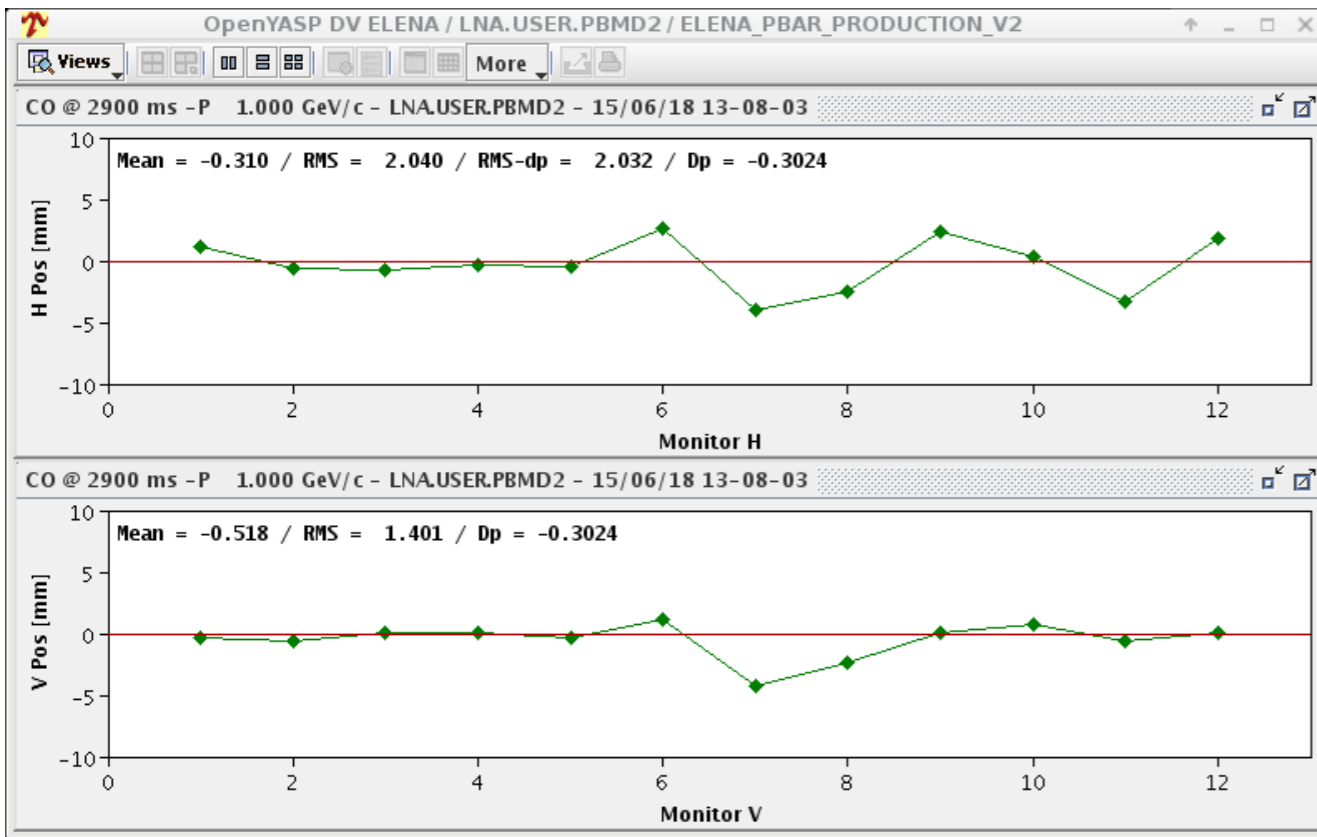


Orbits along cycle



Injection

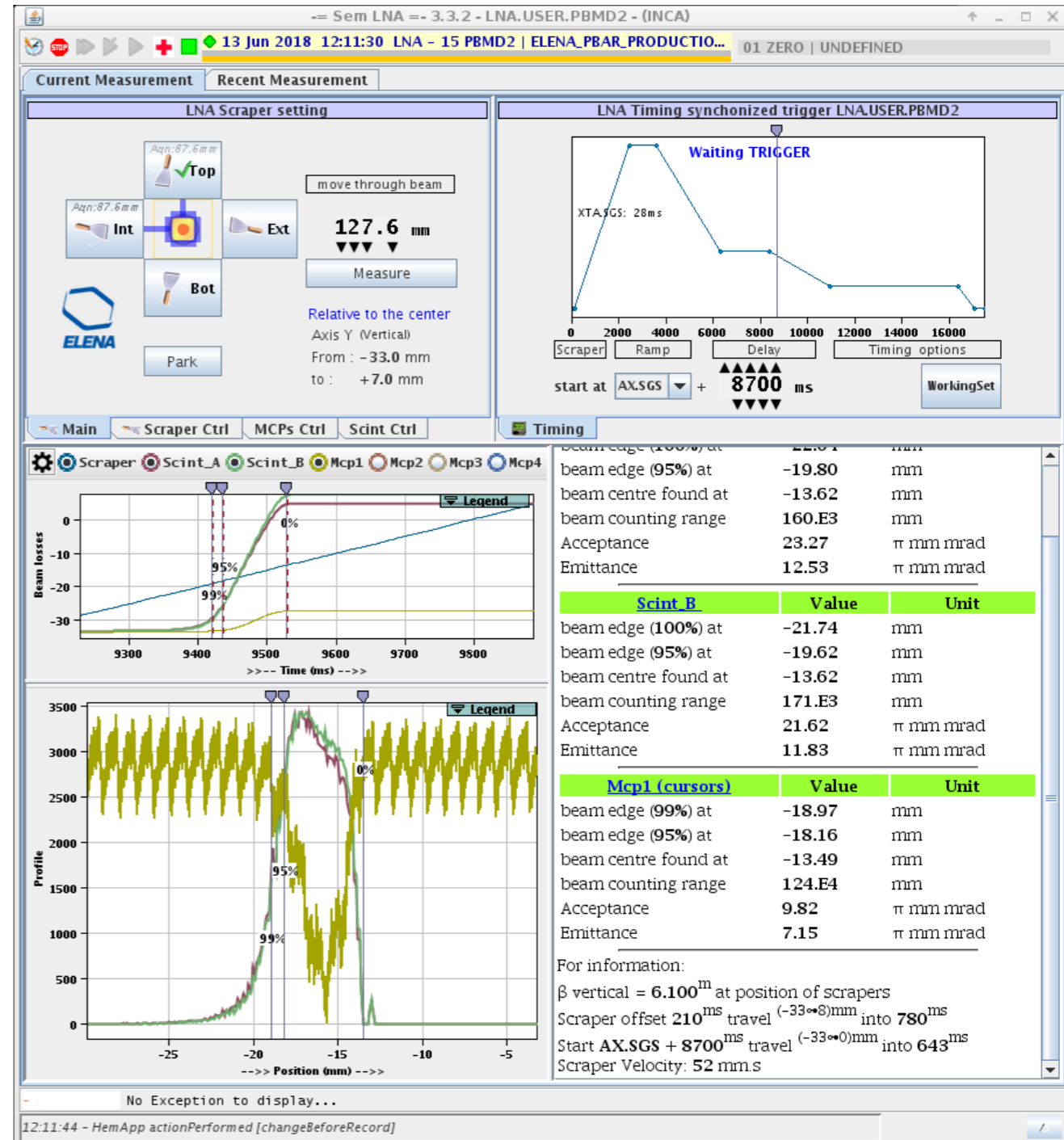
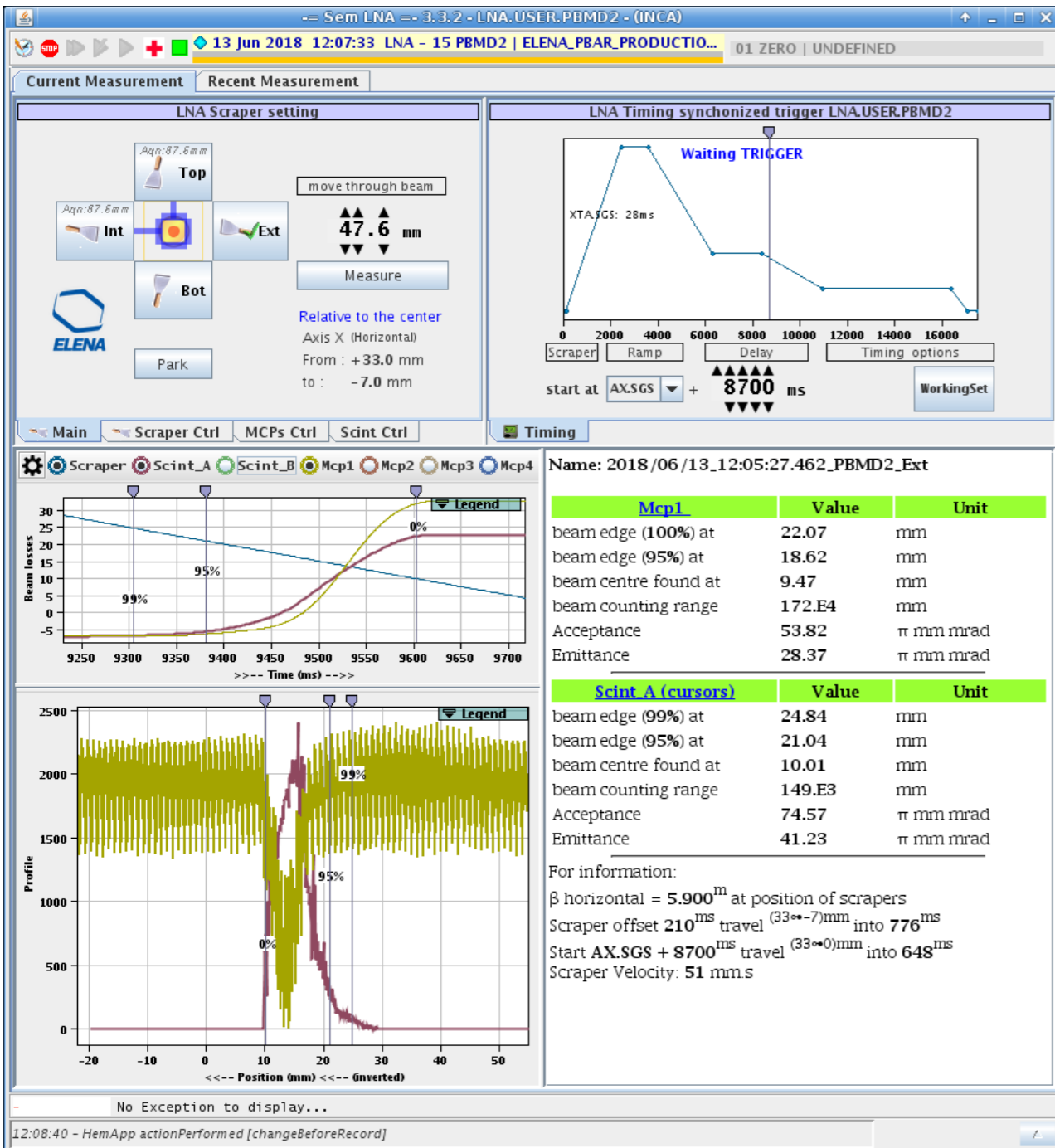
Intermediate plateau



During second ramp

Horizontal = 25 Pi

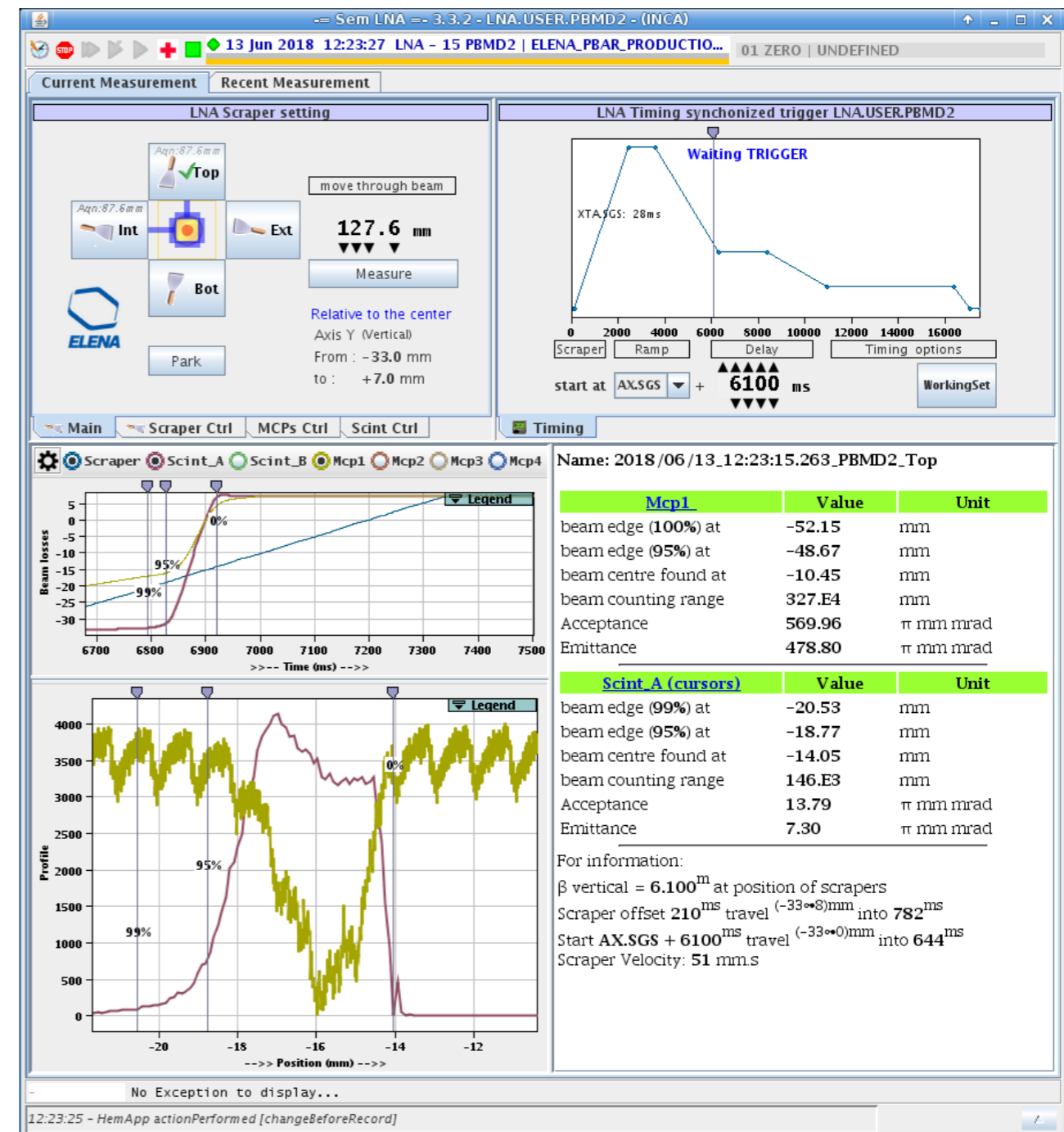
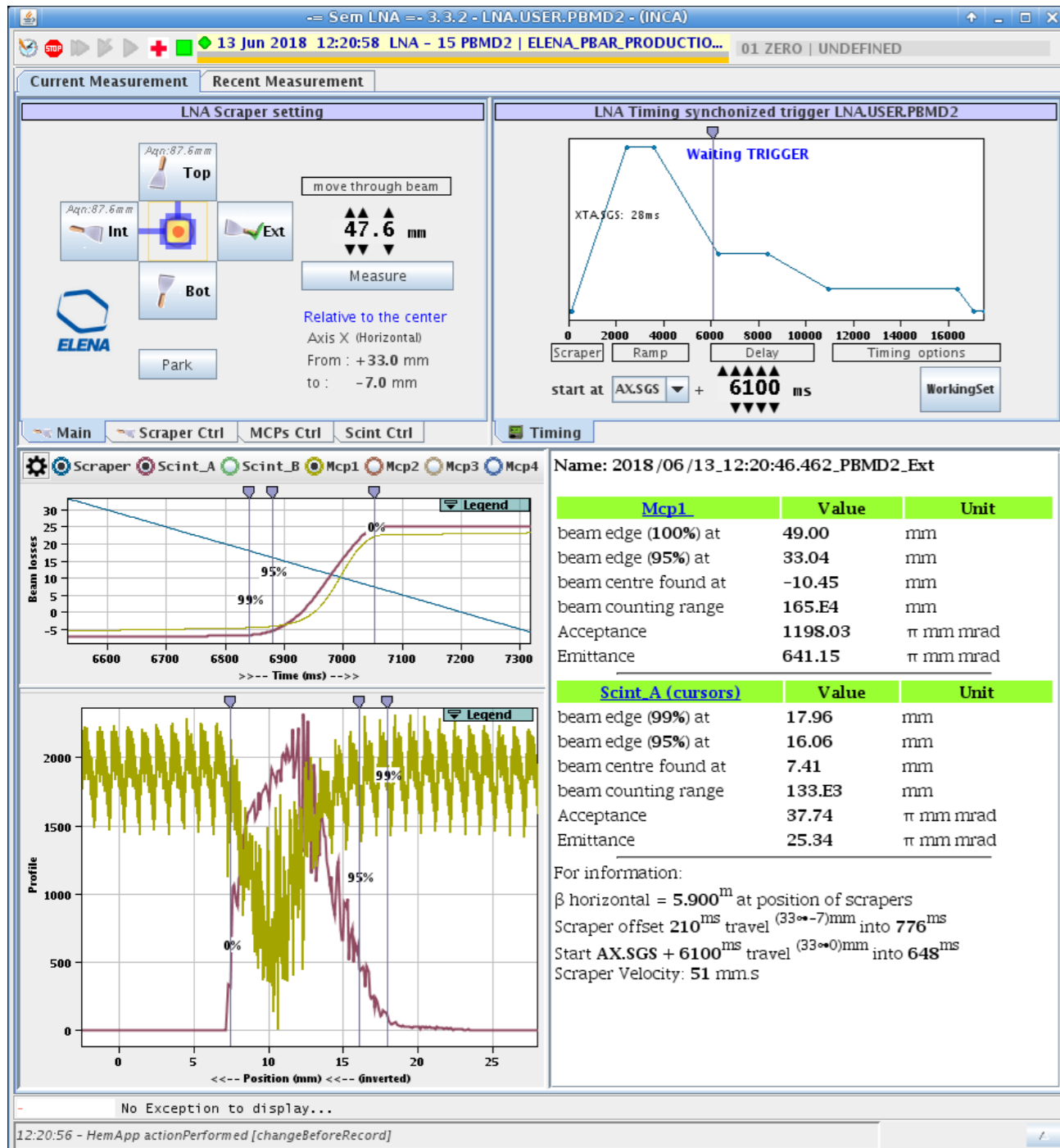
Vertical = 11 Pi



On intermediate plateau

Horizontal = 25 Pi

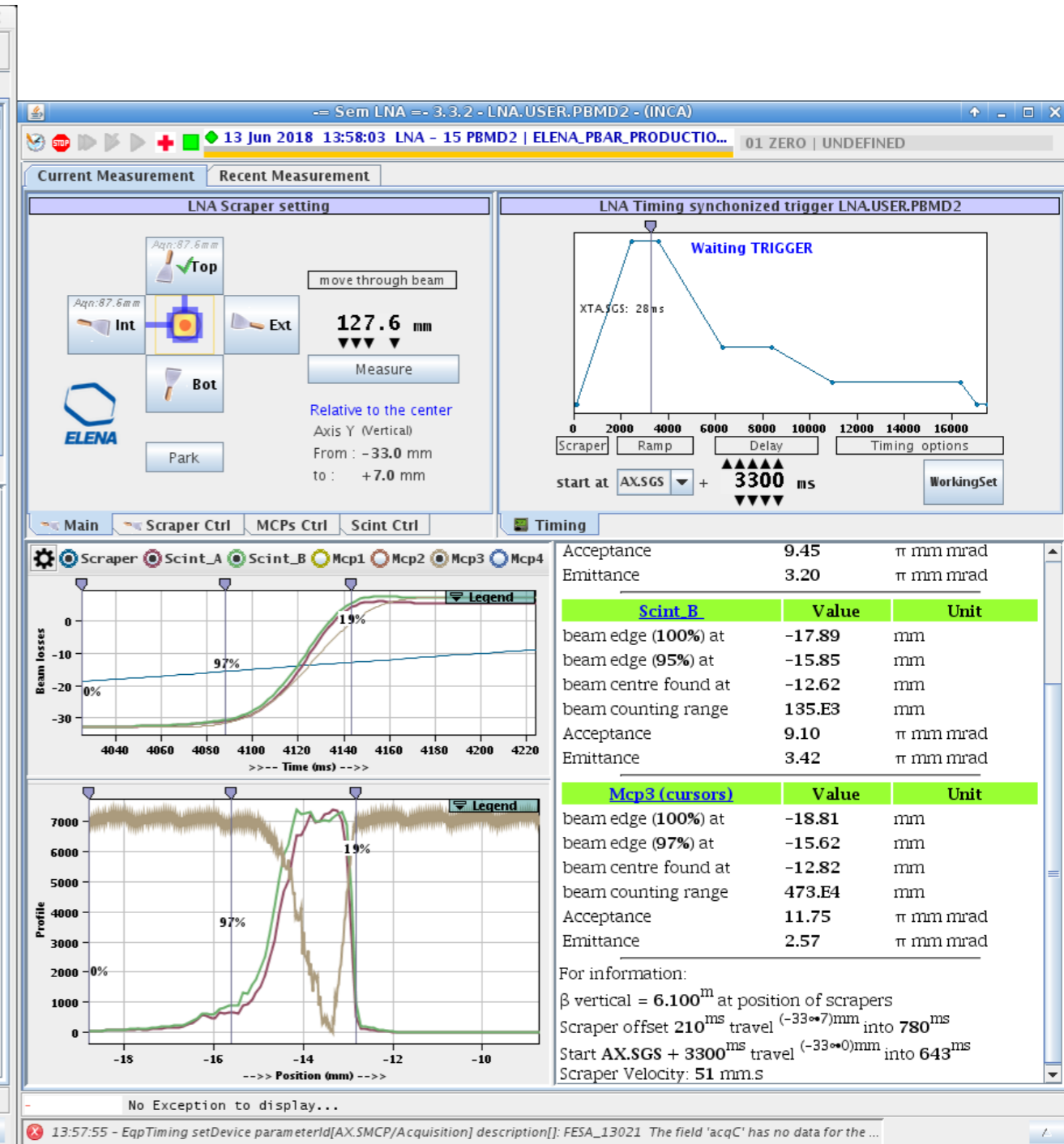
Vertical = 9 Pi



At Injection: strange signal in H
also visible during first ramp???

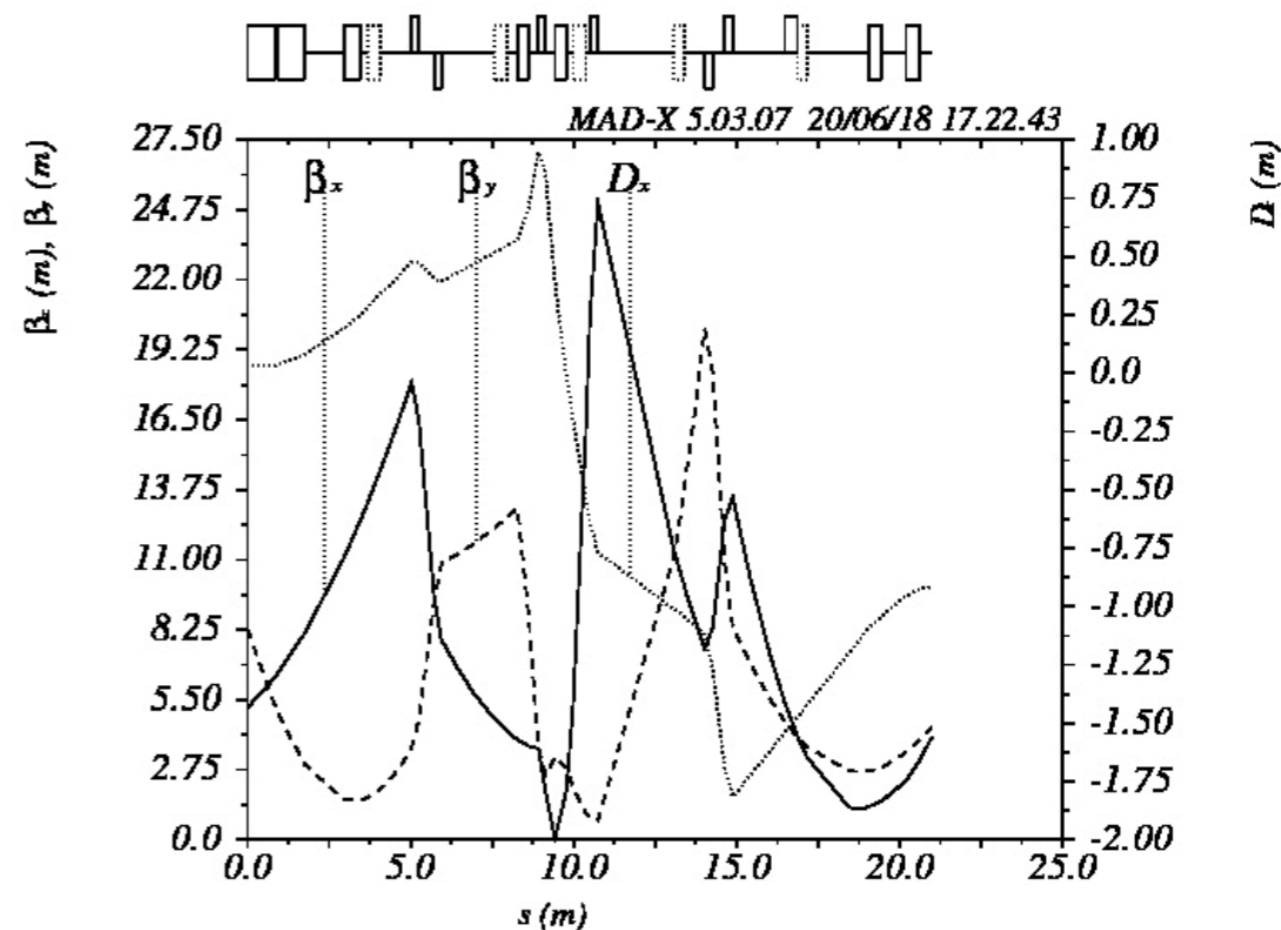
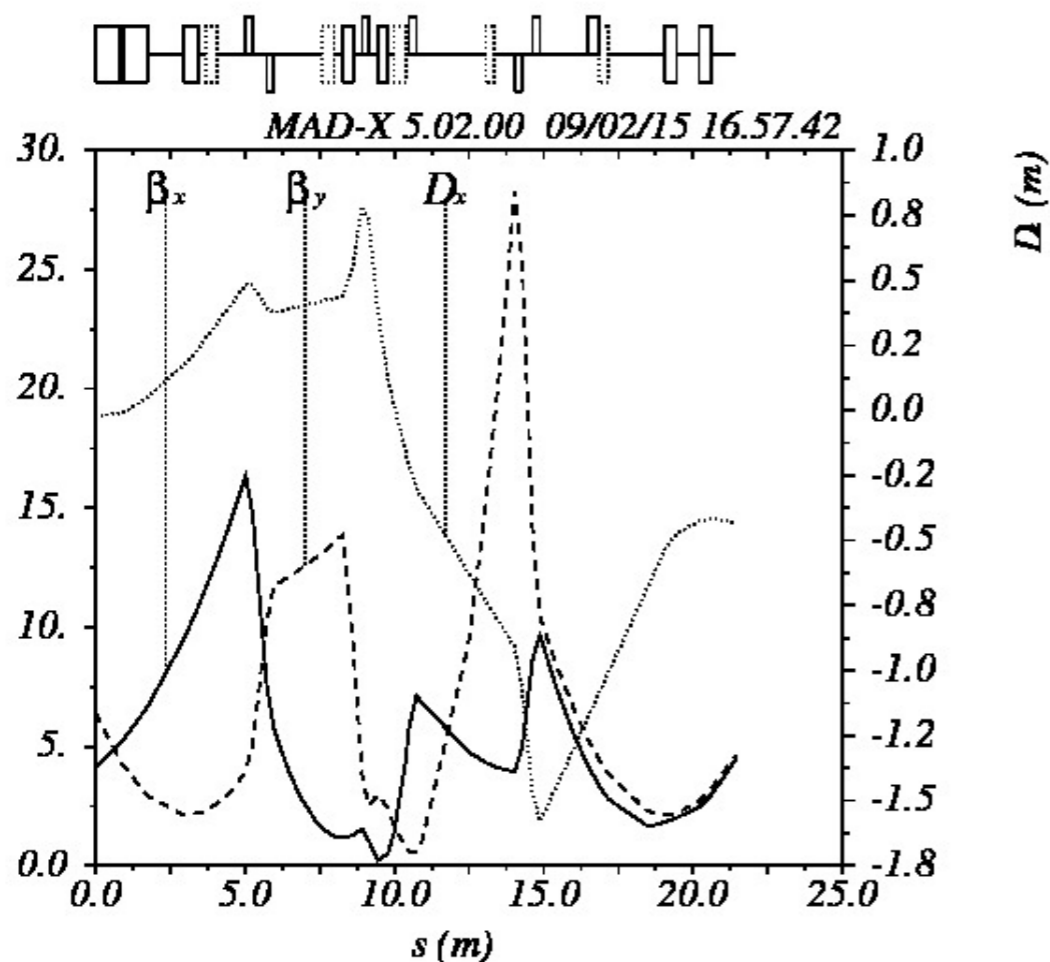
Horizontal = ???

Vertical = 3 Pi



AD-ELENA Transfer Lines optics

- o To reduce potential mismatch during transfer to ELENA, revisited optics
- o 3 optics available:
 - Default optics from last year up to 01/06/2018
 - Nominal optics (the actual reference in the line)
 - New calculated optics tested on 15/06/2018

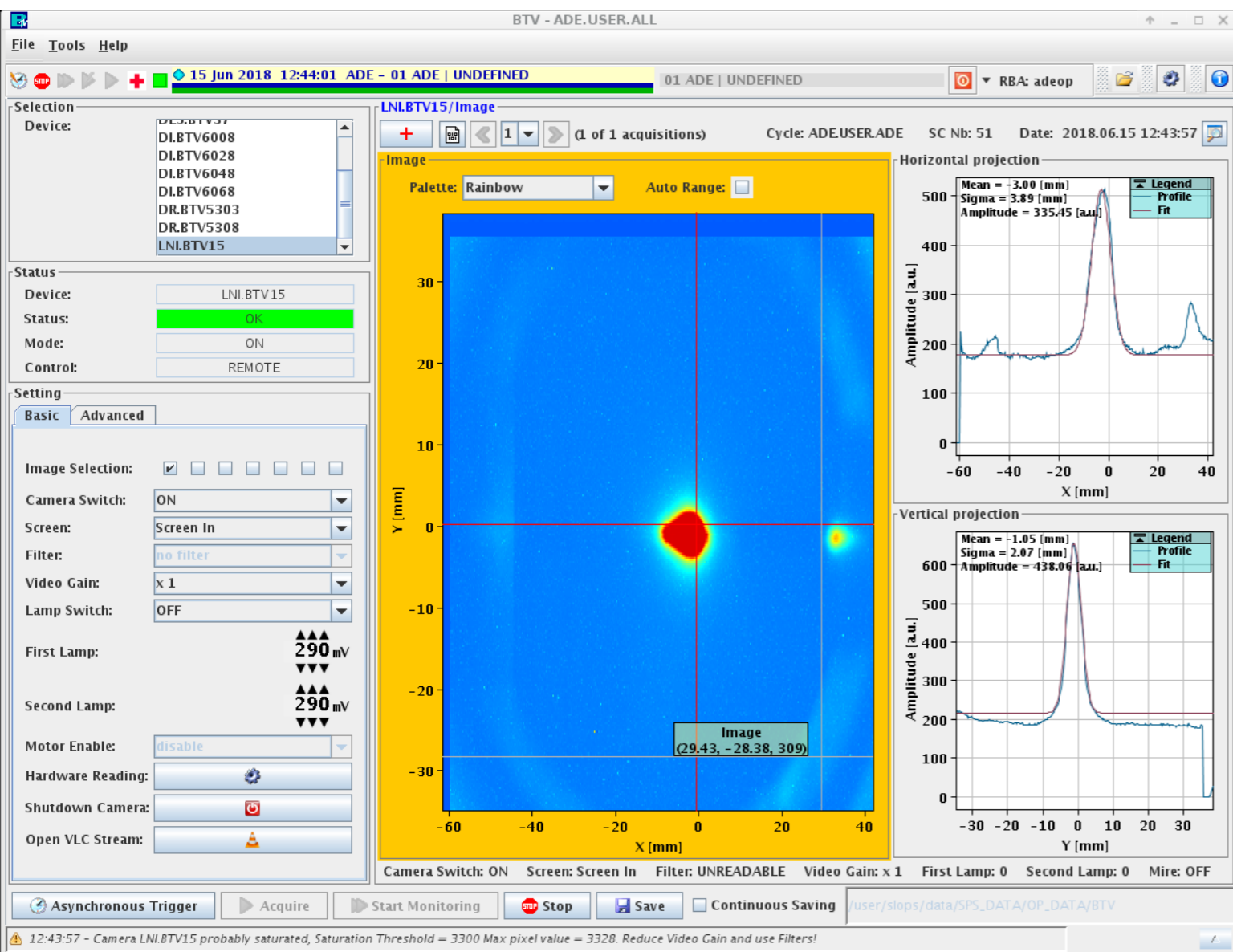


Transfer lines optics

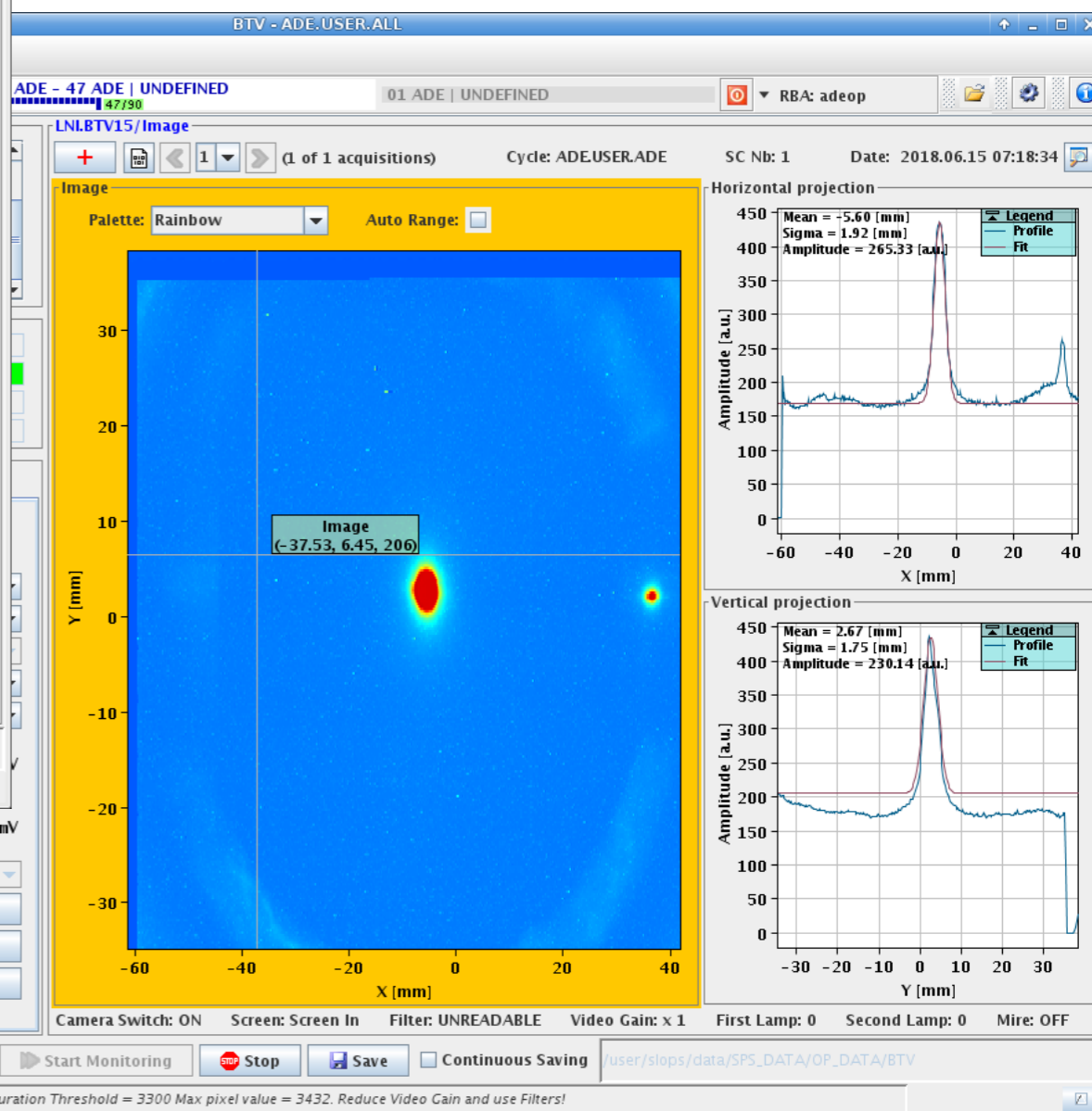
- 0 For the reference, first 2 quads polarity inverted
- 0 The new optics is more precise in view of initial conditions at AD extraction septum.

Quad	OP Name	Name in design doc.	I (2017) (A)	I (ref) (A)	I (new) (A)
QFO7020	QFO7020	QFO7020	-18.3	17.82	15.65
QDE7030	QDE7030	QDE7030	-14.8	14.48	14.43
LNI.MQNAF.0007	LNI.QFN07	Q10	47.05	47.05	73.91
LNI.MQNLQ.0020	LNI.QFN20	Q20		33.9	32.82
LNI.MQNLQ.0040	LNI.QDN40	Q30		30.38	29.1
LNI.MQNLQ.0045	LNI.QFN45	Q40		29.42	32.21

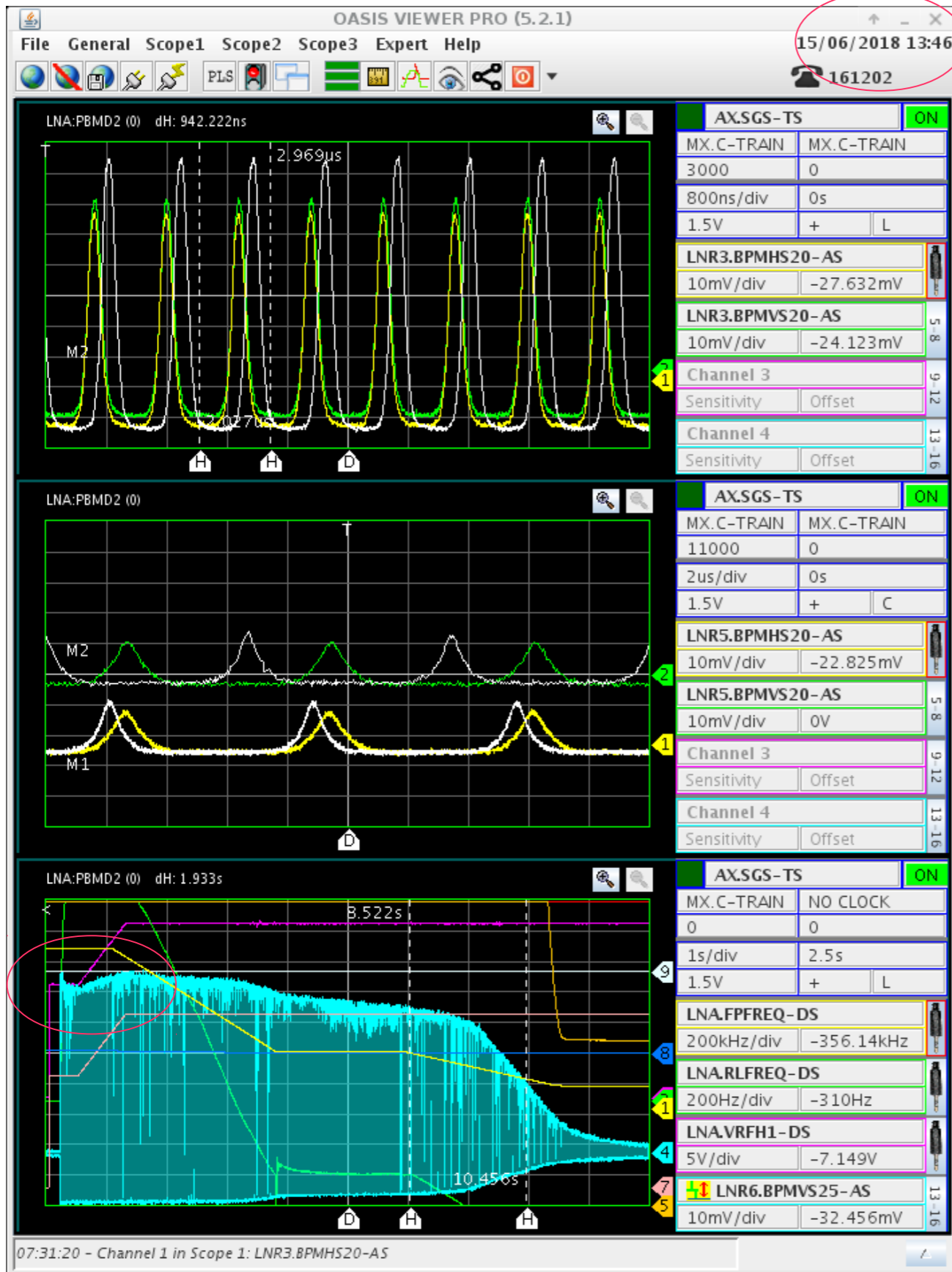
New optics



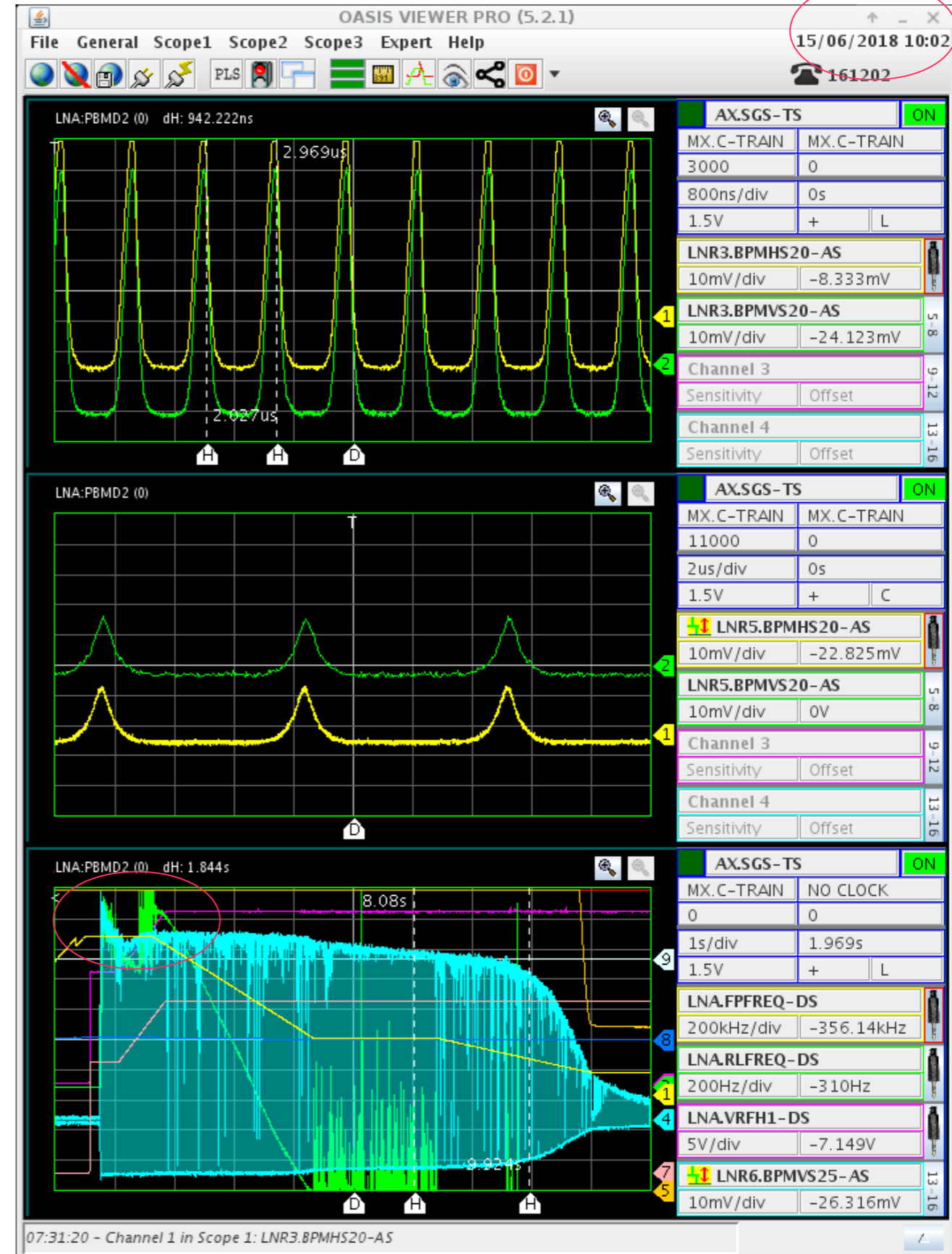
Reference optics



New optics



Reference optics



What's next

- 0 **Switch ON e-cooler magnetic system**
- 0 Investigate the loss during last ramp:
 - Try another working point?, try to disentangle long/trans instabilities?
- 0 Investigate beam profile in H at injection:
 - Injecting with scrapers at different positions IN
 - Matching study → very time consuming
- 0 Correct orbit further during the ramps:
 - Need to tweek controls system