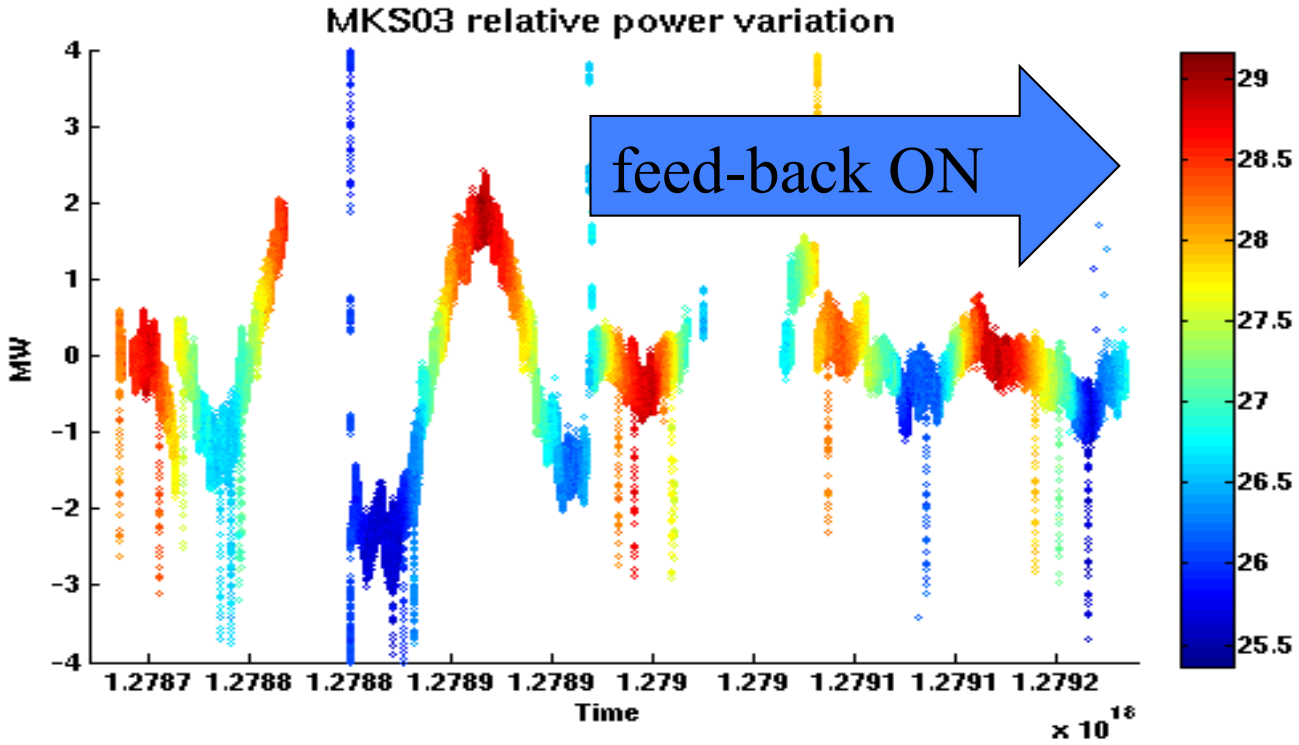
Status previous CTF3 Committee

- RF setup and calibration done
  - RF pulse compression temperature feedback – on two klystrons (good performance)
- New gun heater power supply – was tried but needs more tests
- SHB – Restart – one TWT back from repair, another TWT broken
- BPM
  - recalibrated – some problems corrected, first DL calibration
- Beam to end of linac
  - Quad scan girder 10 - done
  - Match optics based on quad scan - done
- beam through TL1 into CR (3 GHz)

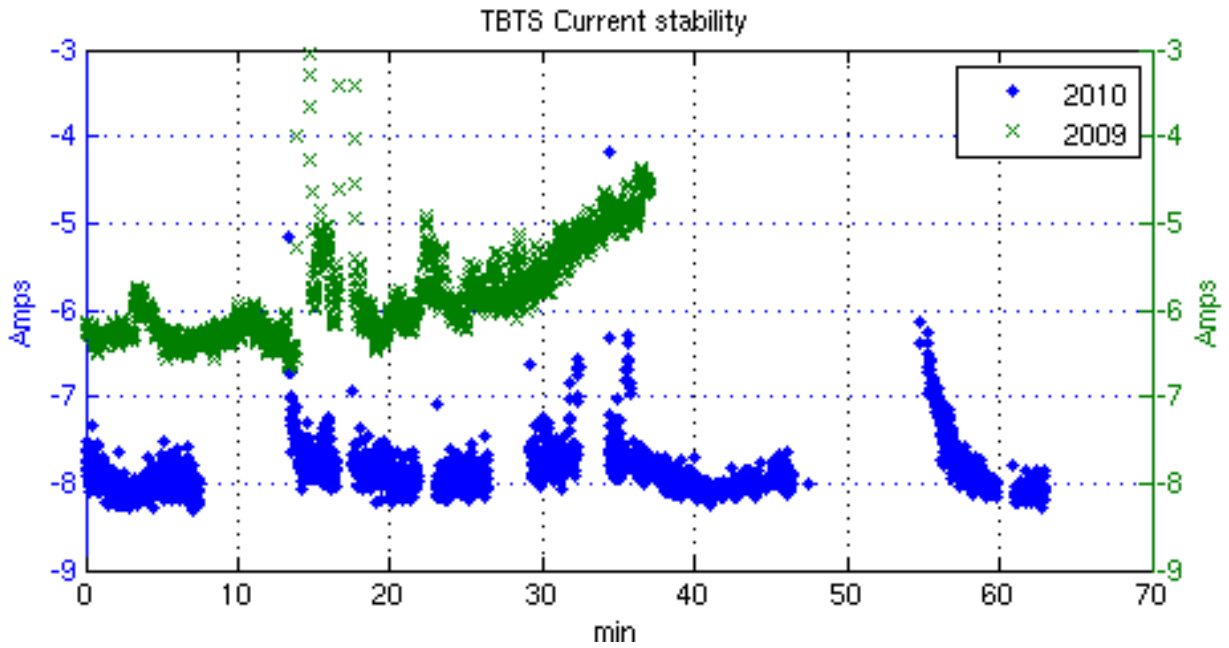
Temperature stabilisation

- RF pulse compression cavities very sensitive to T variations
- Temperature sensors installed along the klystron gallery
- feed-back developed by A.Dubrovskiy
- put in operation for the first two klystrons (MKS03 and MKS05)



RF compressor temp. feedback

- reminder: takes into account ambient temperature/RF power
- now all klystrons with RF compressor have feedback ON
- recovers quickly after klystron trip
- => compressed RF flat top much more stable
- => current in TBTS more stable



Alexey Dubrovskiy

Beam startup - updated

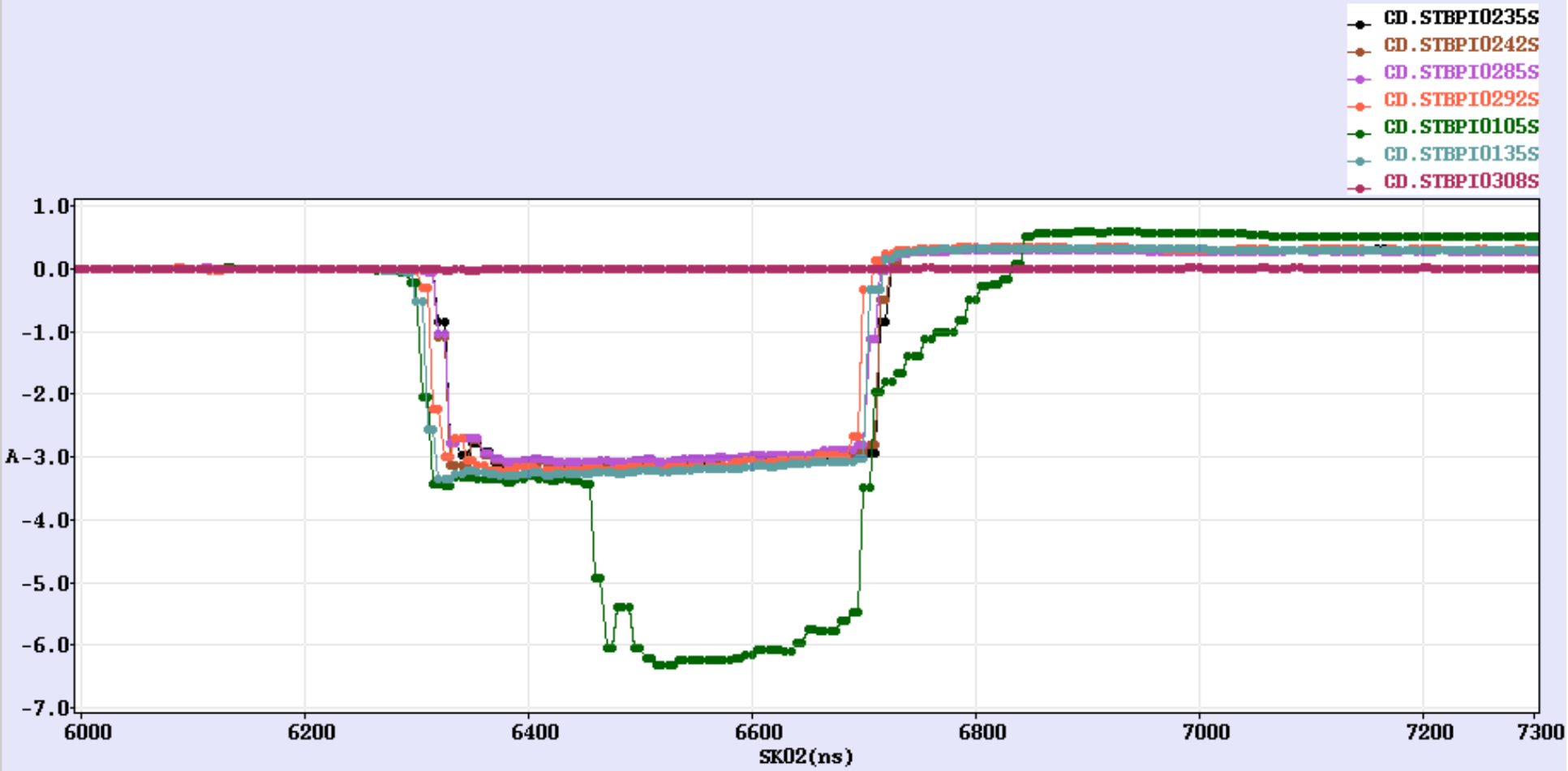
- Beam setup to girder 4
  - Rescale for lower energy (MKS03 lower power) - done
  - Verify segmented dump spectro 4 - done
  - set up bunching/SHB phases (verify with simulation) – done for 3 GHz beam
  - Minimize energy spread / bunch length - done
- Beam setup to girder 10
  - Rematch (quad scan girder 5) – camera optics needs adjustment, matched from girder 10 scan
  - Verify segmented dump spectro 10 (after PHIN run) - done
  - Minimize energy spread (shape RF pulse compression?) – done without shaped RF
- Beam to end of linac
  - Quad scan girder 10 - done
  - Match optics based on quad scan - done
- Beam to DL
  - Quad scan CT line + optics matching (smaller R_{56} later) - done
- Beam through TL1 and CR
  - Orbit correction - done
  - Dispersion and optics measurement – dispersion measurement done

Recombination

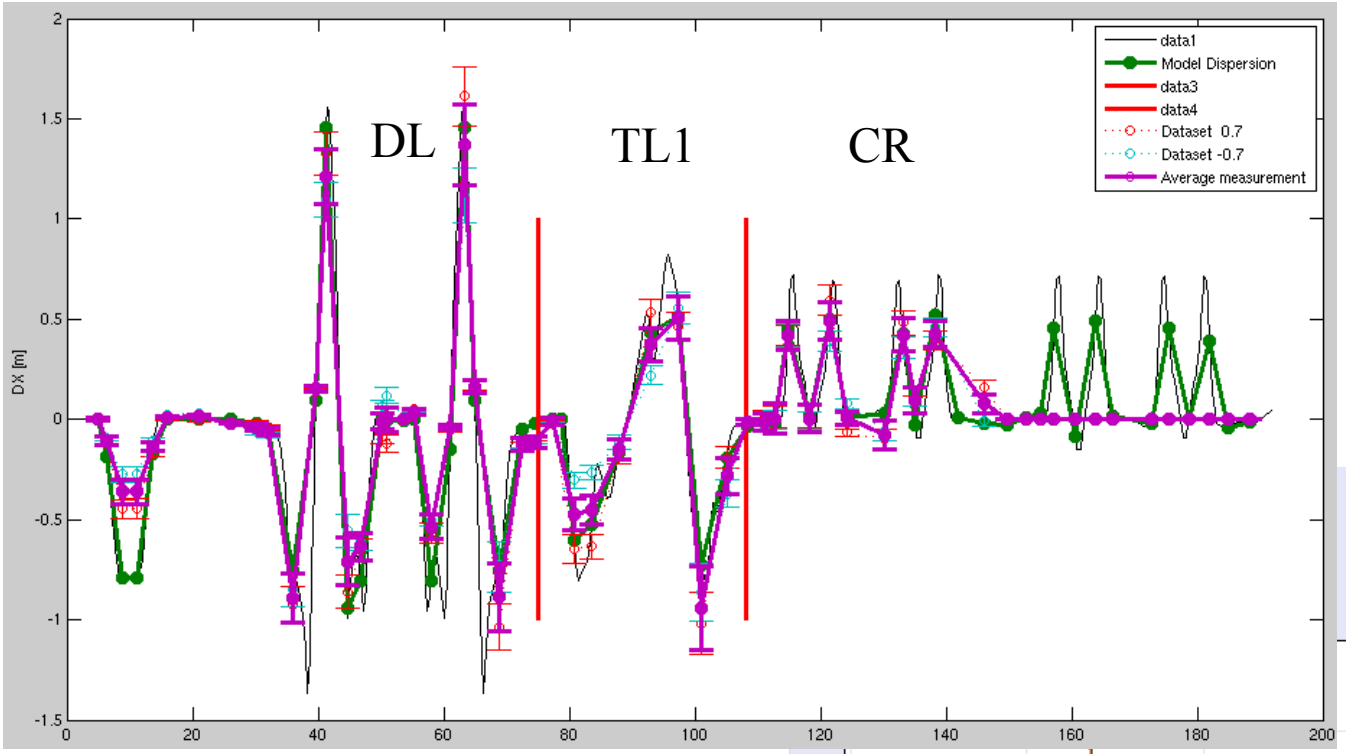
- DL (so far only 3 GHz beam, 1.5 GHz initial setup)
  - dispersion - done
  - single kick measurements – done, to be redone (new BPM calibration)
  - optimize RF injection
  - adjust DL path length (rematch?)
  - quad scan straight/after 1 turn
- DL + CR
  - injection closure (program)
  - path length tuning (BPR and Streak Camera)
  - quad scan of various turns / combined beam
  - transport through TL2

Delay Loop

- Full transmission achieved (not combined)

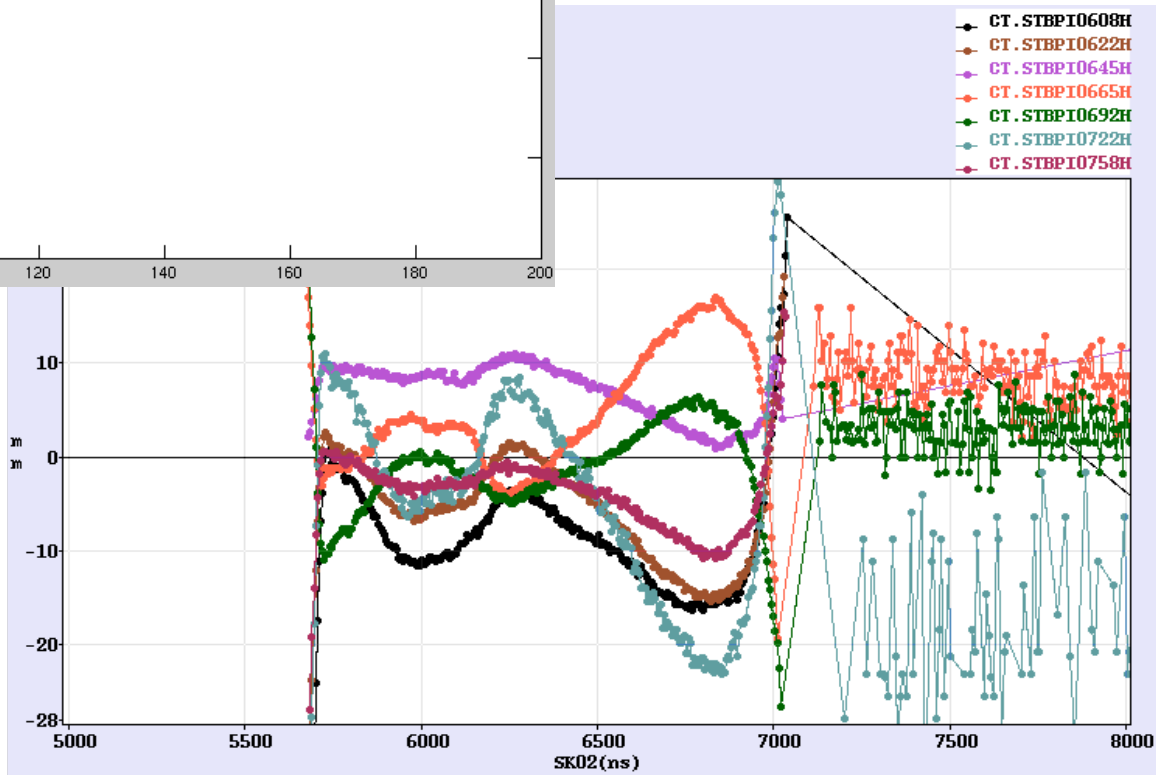


Dispersion



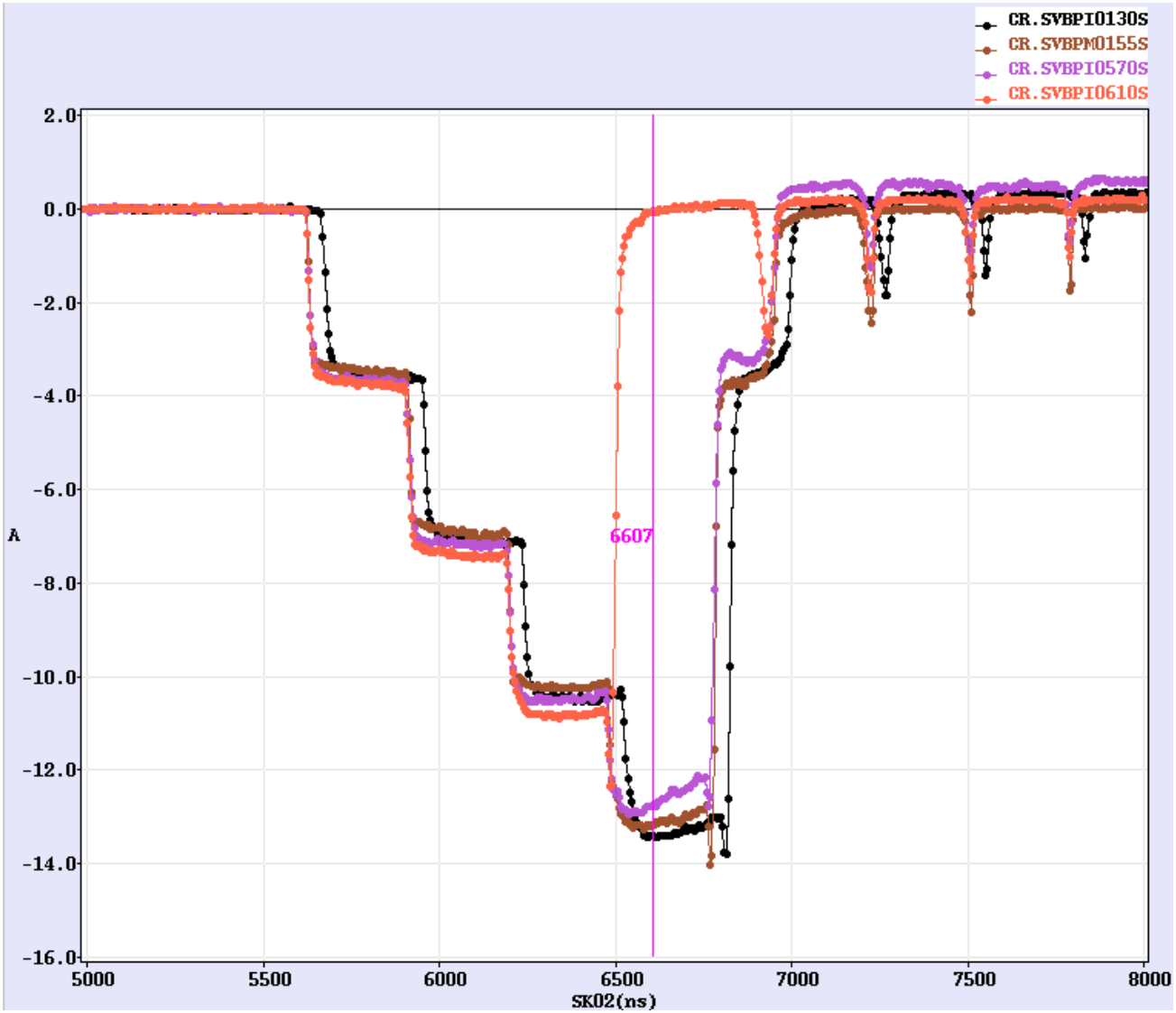
- Dispersion DL + TL1 + CR close to model

- large energy variation along the pulse =>
- started to shape RF pulse

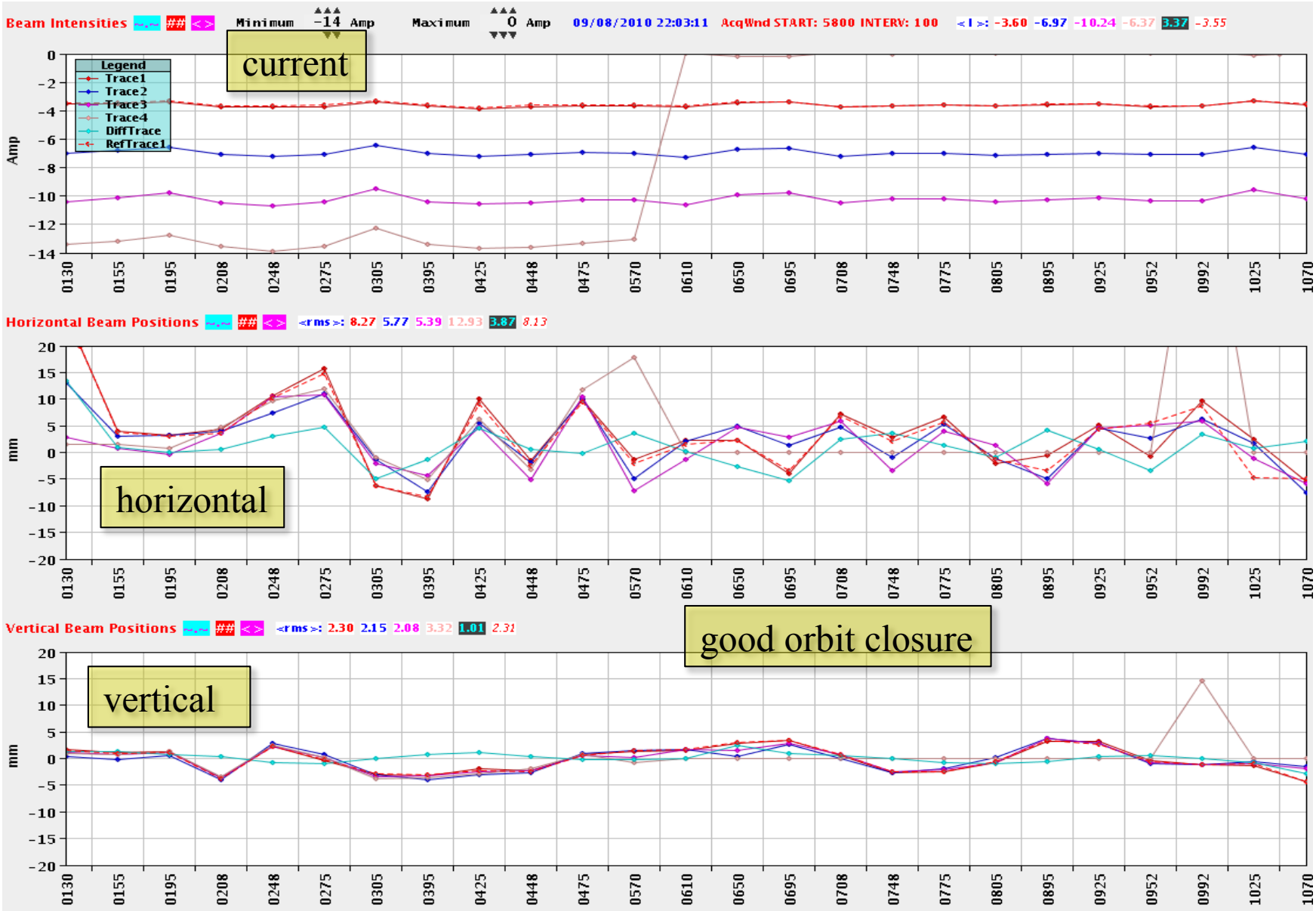


CR recombination

- CR recombination factor 4 with 3 GHz beam established

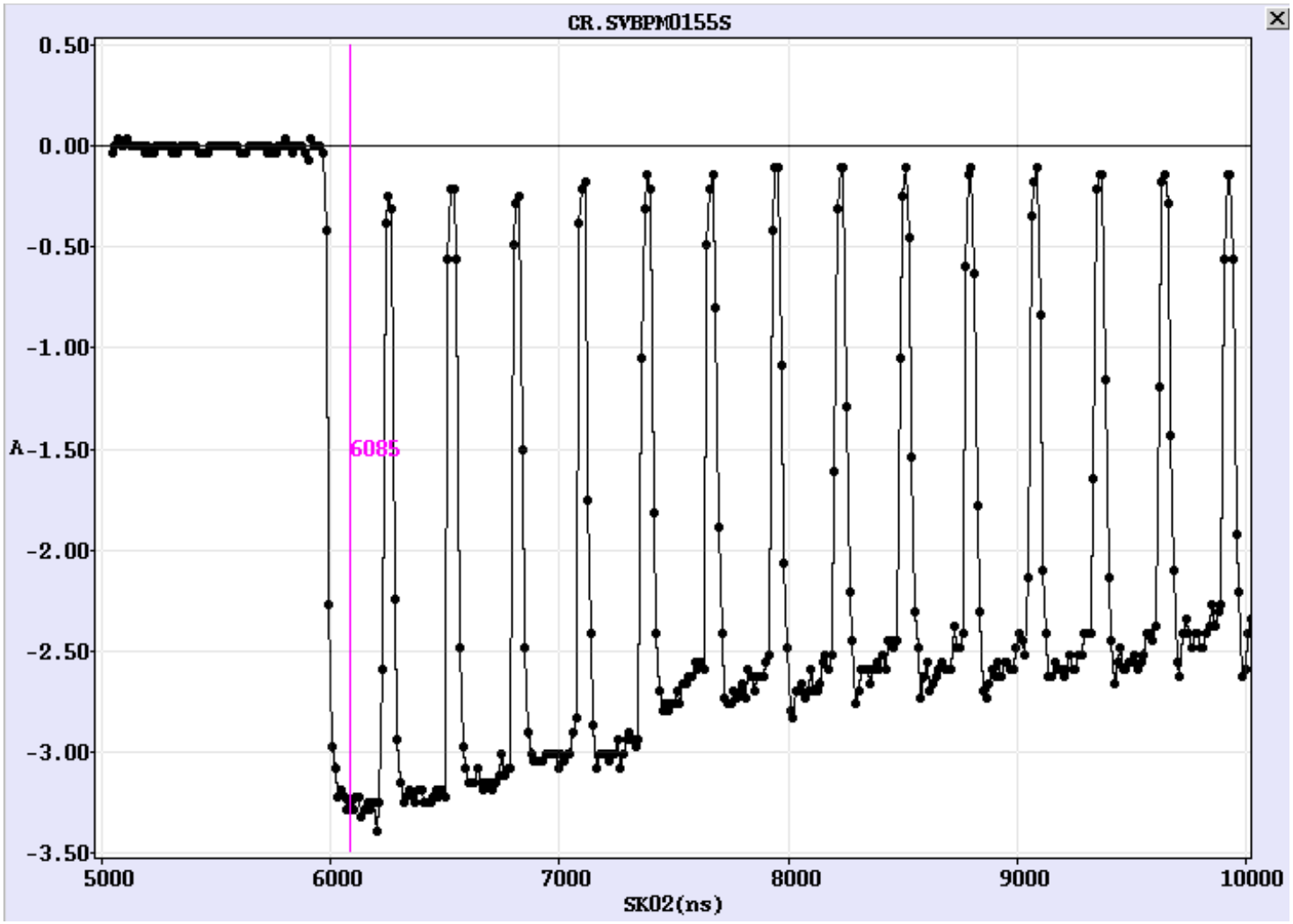


CR recombination



Combiner Ring circulating beam

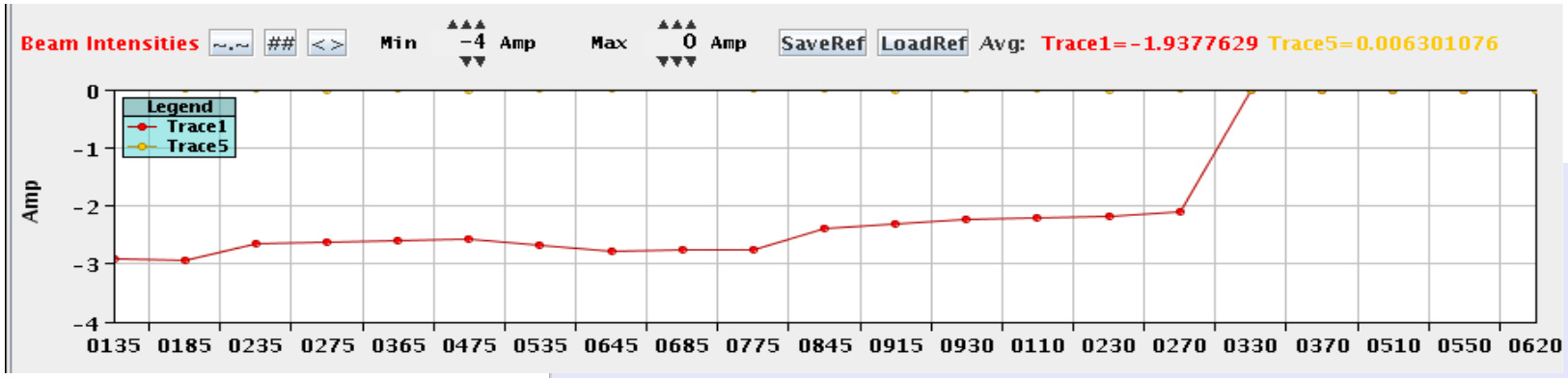
- tests for tune measurements – being analyzed

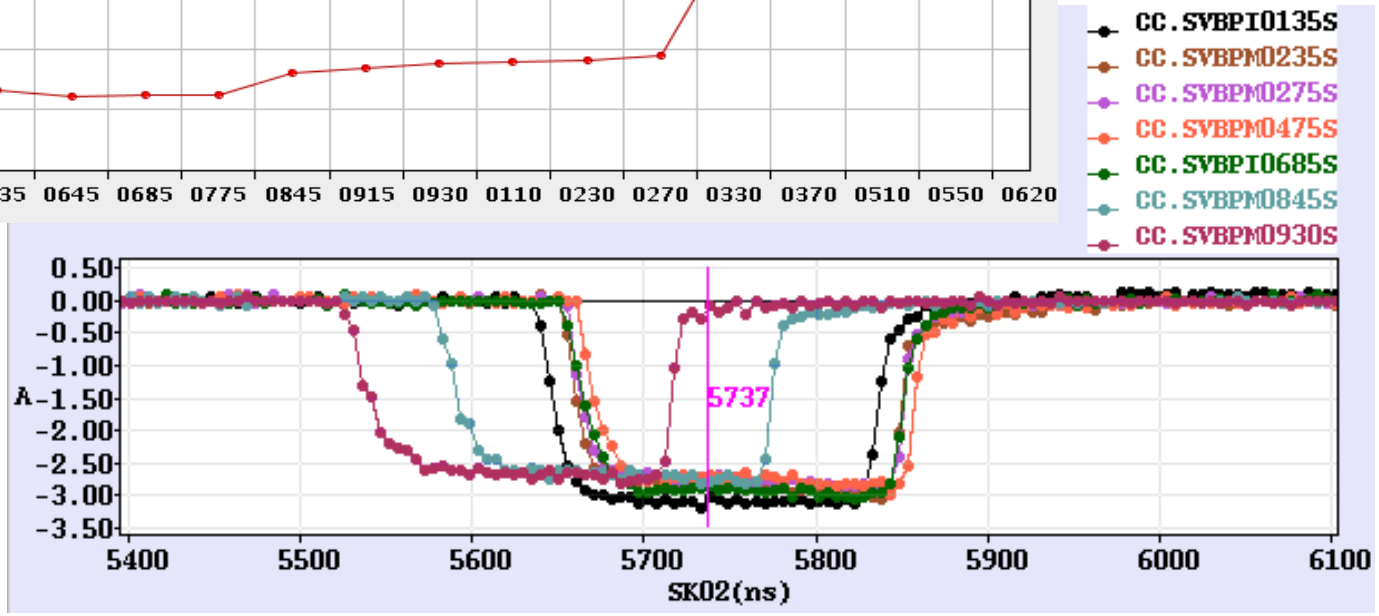


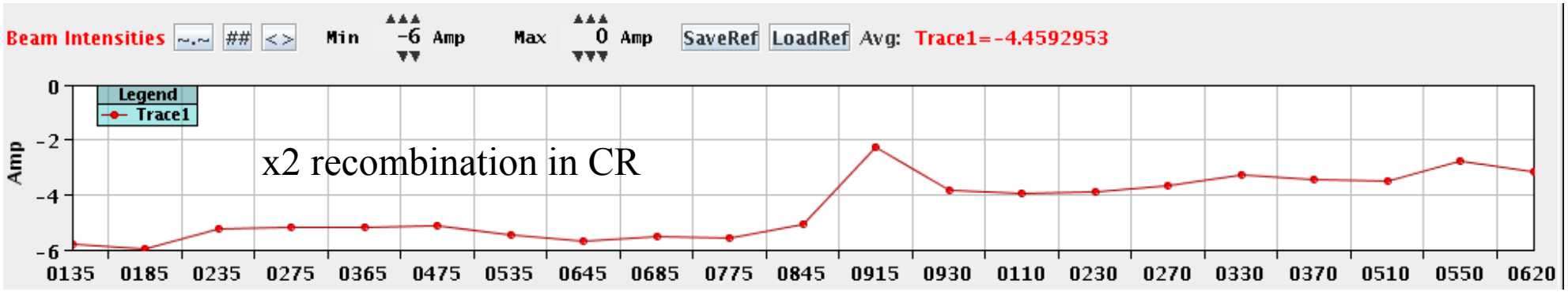
TL2

- first beam 18 July
- BPM calibration – done, some problems fixed, BPMs work fine
- start with theoretical optics for measured energy
- BPM time delays with beam – done, fine adjustment to do
- Dispersion (H/V) – done, corrected at beginning of line
  to be refined
- Single kick measurements (precise) – done, to be refined
- Quad scans - started
- give first beam to TBL/TBTS – done
  finally up to 7 Amps through TBTS PETS

TL2 (cont.)


Beam Intensities
Min -4 Amp
Max 0 Amp
SaveRef
LoadRef
Avg: Trace1=-1.9377629 Trace5=0.006301076
Legend
Trace1
Trace5
Amp
0135 0185 0235 0275 0365 0475 0535 0645 0685 0775 0845 0915 0930 0110 0230 0270 0330 0370 0510 0550 0620


CC.SVBPI0135S
CC.SVBPM0235S
CC.SVBPM0275S
CC.SVBPM0475S
CC.SVBPI0685S
CC.SVBPM0845S
CC.SVBPM0930S
5737
A
SK02(ns)


Beam Intensities
Min -6 Amp
Max 0 Amp
SaveRef
LoadRef
Avg: Trace1=-4.4592953
Legend
Trace1
Amp
x2 recombination in CR
0135 0185 0235 0275 0365 0475 0535 0645 0685 0775 0845 0915 0930 0110 0230 0270 0330 0370 0510 0550 0620

Update on TBL activities 17.08.2010

Steffen Döbert

- ❑ We had only a few occasions to run beam through TBL until now
- ❑ Checked out hardware

Testing of the new BPM acquisition system which seems to work fine now

Testing of the quadrupole movers with remote control

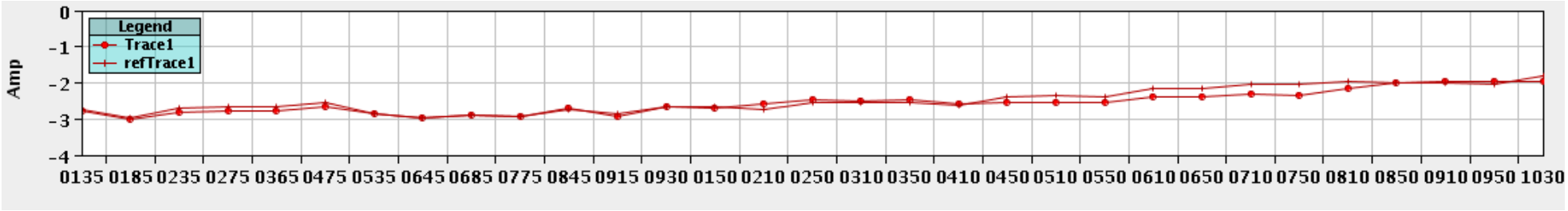
End of line spectrometer hardware and software

New emittance screen at the end of the line

Commissioning of new operation software

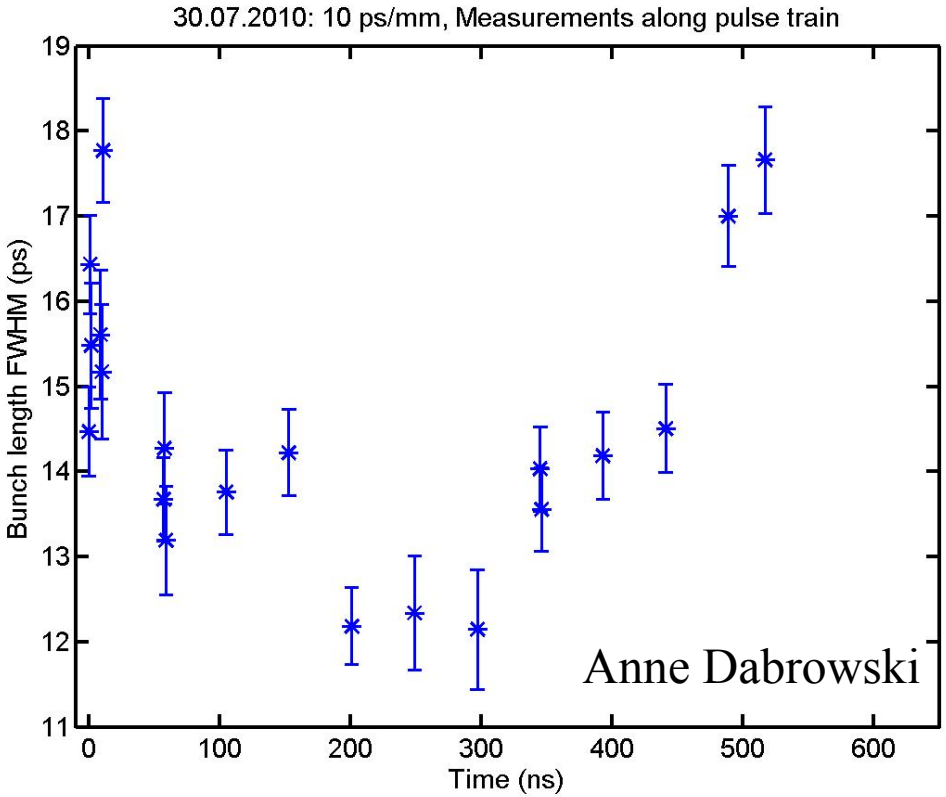
- ❑ Measured beam parameters at the entrance of TBL and performed successfully matching for a 3 A beam which was transported to the end of the line
- ❑ Power measurement in the PETS confirmed that repair of water leak in the PETS tank worked out well

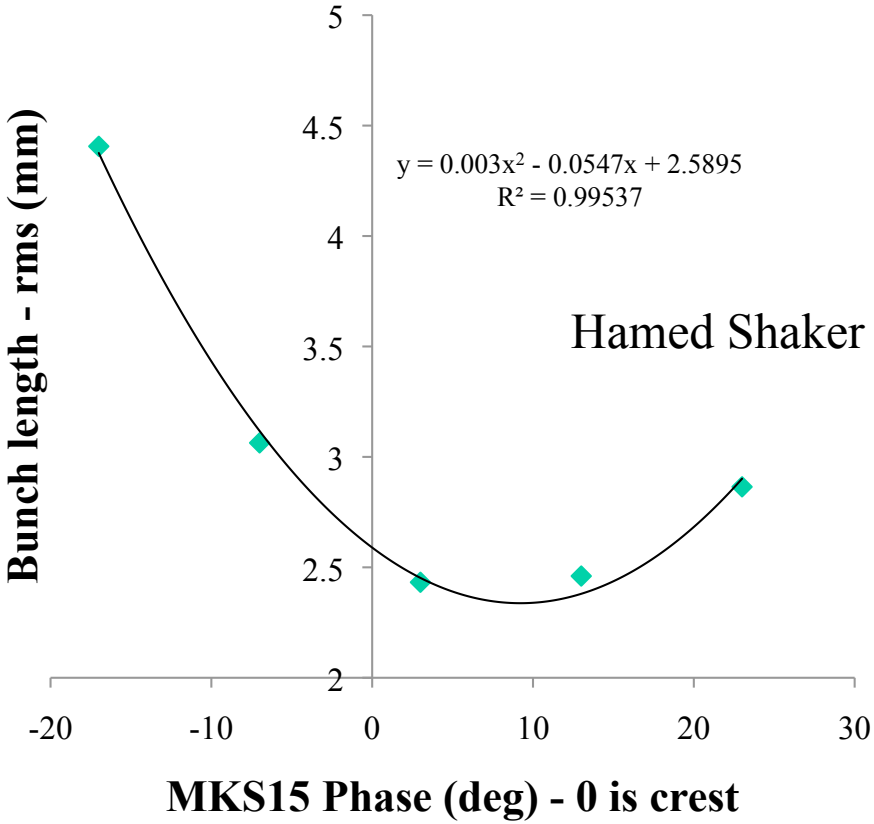
→ Waiting for more beam and higher current



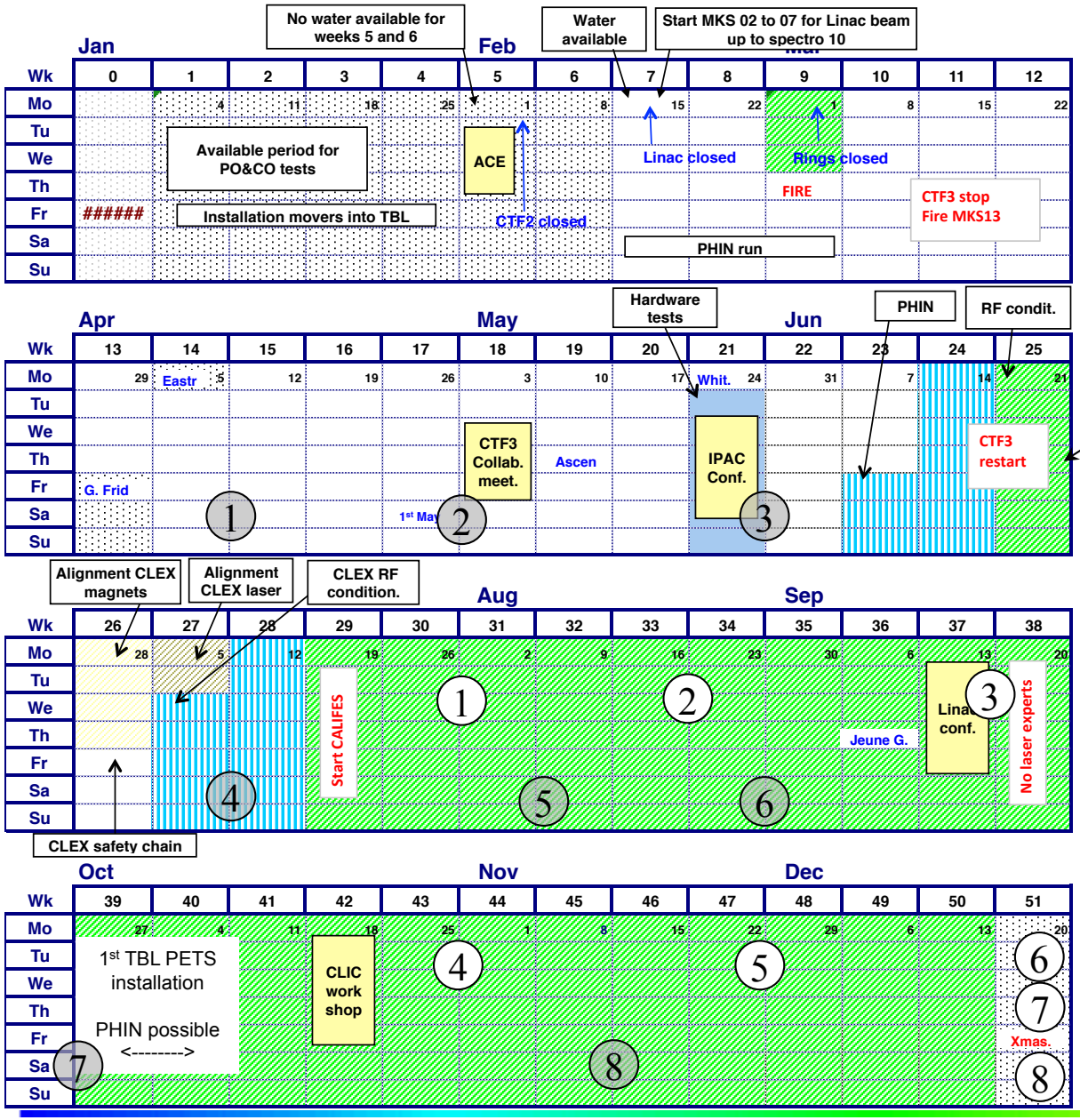
Bunch length measurements

- Bunch length measured by Streak Camera and RF deflector
- along the pulse train / as a function of phase of MKS15
- analysis ongoing





Schedule (updated)



1. Optics improvements (DL dispersion)
   Full transport to CLEX
   Bunch length control (first tests)
   TBTS initial PETS tests
   CALIFES setup
   ~~new setup when MKS13 available?~~
2. PETS conditioned to nominal power/pulse length
   TBL PETS tests
3. Accelerating structure conditioned to nominal power/pulse length — Two-Beam test power & energy gain, 100MV/m
4. TBL studies (limited) — PETS breakdown rate measurements???
5. Measurement of breakdown kicks — Beam Loading compensation experiment
6. Measurement of effect of beam loading on breakdown rate
7. Test of new PETS on-off scheme
8. TBL studies 30% deceleration ?

2nd TBL PETS installation

6 weeks PHIN phase-coding Laser preparation

- Stability studies & improvements
- PETS no recirculation
- Phase stability
- Operation at 5 Hz (or more)
- Control of beam losses
- Coherent Diffraction Radiation …

Conclusion

- latest news: gun - cathode broke Tuesday night
  - visible damage to the grid
  - got changed
  - just got conditioned up to nominal high voltage
- good progress since last meeting – machine more stable
  - large effort on RF calibration and stabilization
  - reference program (Tobias Persson)
- first tests in TBL and TBTS (see Roger)
- priority now: increase current and RF power in CLEX
  - test 12 GHz attenuator and phase shifter
  - test TBL PETS
- will need more time to set up **systematically** CR recombination and TL2
  - injection matching, optics,
  - quad scans TL2 for various turns