



Week 22

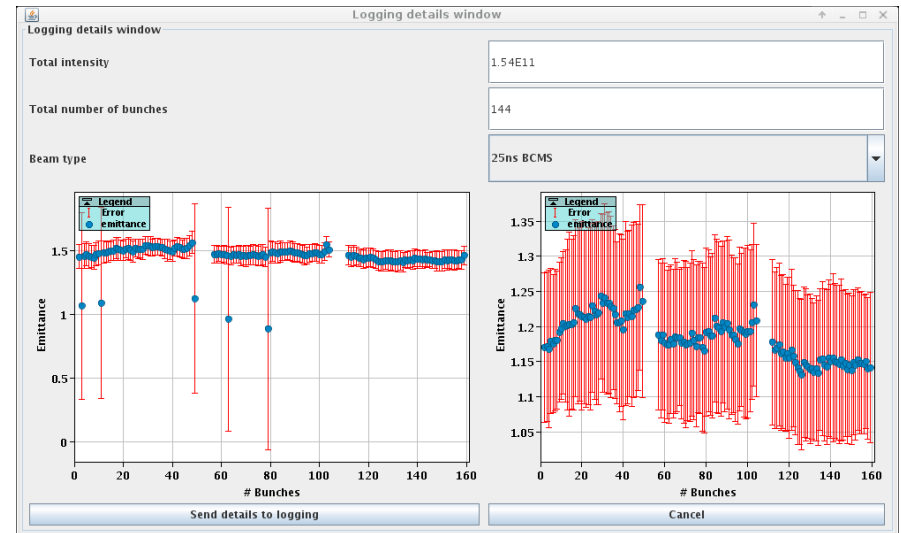
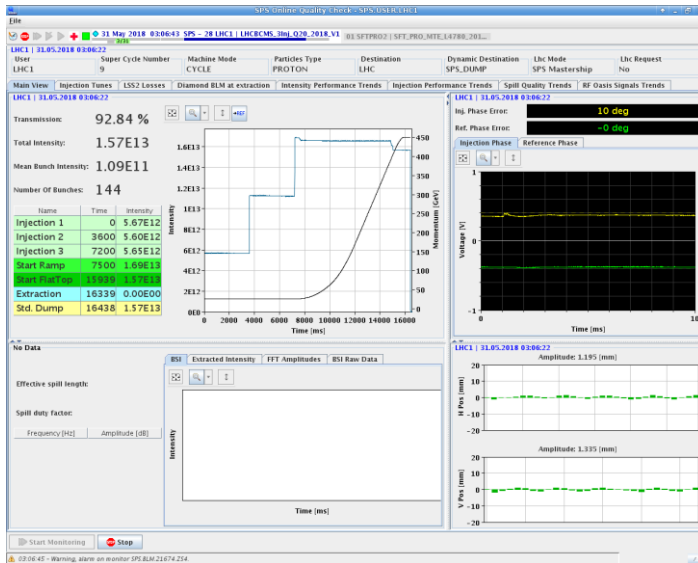
MSWG Report – SPS OP Crew

Status of beams



LHC beams:

- BCMS used regularly for physics
- ~~Instabilities at flat top did not re-occur – chromaticity raised~~
- Start thinking about **instability monitoring** at flat top
- Intensities: $\sim 1.1e11$ ppb, emittances: $\sim 1.3\mu\text{m}$



Status of beams



LHC beams:

16L2 struck once again yesterday evening! BCS not yet entirely optimized...

- BCMS used regularly for physics

- Instability

- Start the

- Intensi

Vistars - Mozilla Firefox

BE/OP Webpickets x Vistars x OP Piquet Roles and ... x +

https://op-webtools.web.cern.ch/Vistar/vistars.php

LHC Page 1

Vistar

LHC Page1 Fill: 6746 E: 6499 GeV t(SB): 00:00:00 31-05-18 17:00:47

PROTON PHYSICS: BEAM DUMP

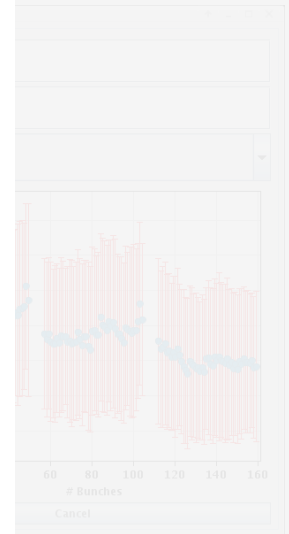
Energy: 6499 GeV I(B1): 2.07e+09 I(B2): 1.71e+09

BTVD.689339.B1 Updated: 16:51:56

BTVD.629339.B2 Updated: 16:51:56

Comments (31-May-2018 16:54:25)	BIS status and SMP flags	
	B1	B2
Dump due to losses at 16L2	Link Status of Beam Permits true	true
	Global Beam Permit false	false
	Setup Beam false	false
	Beam Presence false	false
	Moveable Devices Allowed In false	false
	Stable Beams false	false

AFS: 25ns_2556b_2544_2215_2332_144bpi_20injV2 PM Status B1 **ENABLED** PM Status B2 **ENABLED**



Status of beams



LHC beams:

The SPS Gruffalo struck later as well!!! Under study...

- BCMS used regularly for physics

- Insta

- Start

- Inter

LHC Injection Quality Check GUI 2.3.0

File Mask Help

RBA: lhcop

Beam 1: Beam 2:

Injection Beam 1 Injection Beam 2

2018-06-01 1:11:40.289: Beam injected! Errors in filled RFbuckets, injected 90 bunches. BLM analysis was bad. All BPMs = 0. Bad result for tra...

2018-06-01 1:11:40.289: Losses on transfer line BLMs. 51 monitors are out of tolerance.

BEAM EXTR. INJ. KICKER BEAM LOSS RF BUCKETS INJ.OSCILL. TRANSFER LINE RF PHASE SCRAPING DBLM

2018-06-01 1:11:40.289: Losses on transfer line BLMs. 51 monitors are out of tolerance.

monitor	loss	threshold
T12.BLM1.29408	0.0880	0.0100
T12.BLM1.29504	0.0702	0.0100
T12.BLM1.29512	0.0556	0.0100
T12.BLM1.29538	0.0586	0.0100
T12.BLM1.29556	0.0091	0.0100
T12.BLM1.29573	0.0055	0.0100
LHC.BLM1.4L2B1	0.0004	0.0100

Beam losses [Gy]

Bunch selection BPM selection

Trajectory offset [mm]

Reference Tolerance (84, 3)

Show/Hide table

BPCK.610015
BPCK.610211
BPCK.610312
BPCK.610340
BPCK.610539
BPMI.20104
BPMI.20204
BPMI.20404
BPMI.20504
BPMI.20704
BPMI.21004

Get LSA references Set references

Get last result: B1 Get last result: B2 Stop monitoring: B1 Stop monitoring: B2 Unlatch: B1 Unlatch: B2

No Exception to display...

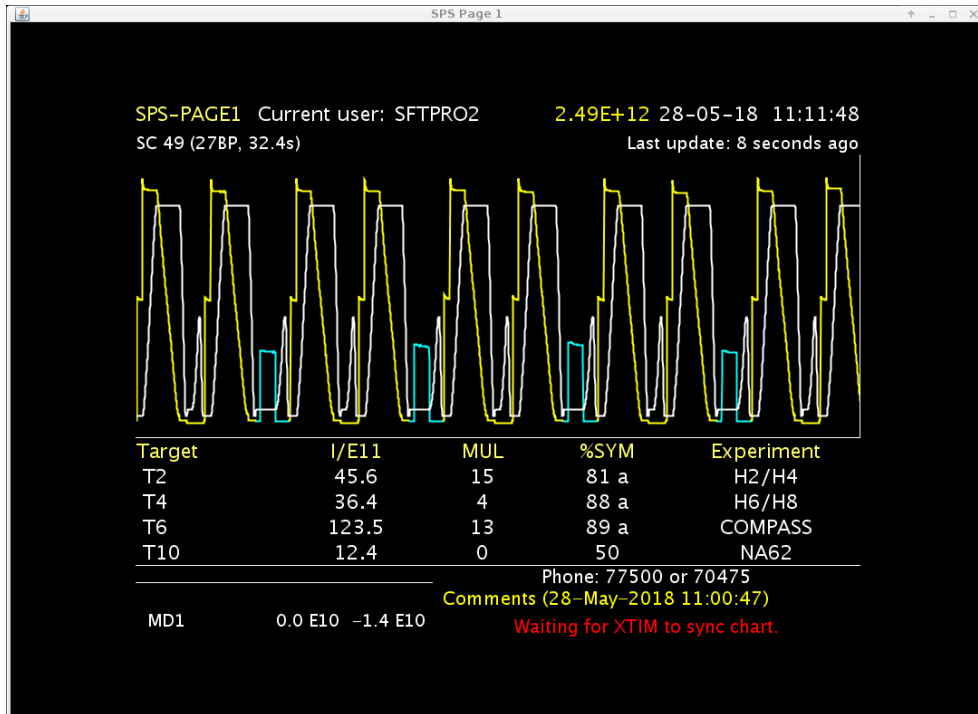
01:11:47 - WARNING NO DCUM VALUE FOR BLM1.HC.BLM.SR2.R.CD16.CH12



Status of beams



- SFTPRO → $\sim 2.8e13$ ppb
 - Planned to move from 40 to 50 units on T2 on Wednesday



- Lost the **power converter transformer** of the extraction line dipole MBE2103 on Wednesday night
- Trip due to low oil level, further **investigation ongoing to check for potential damage** of the transformer.
- Waiting for further diagnosis...

Crab cavity MDs

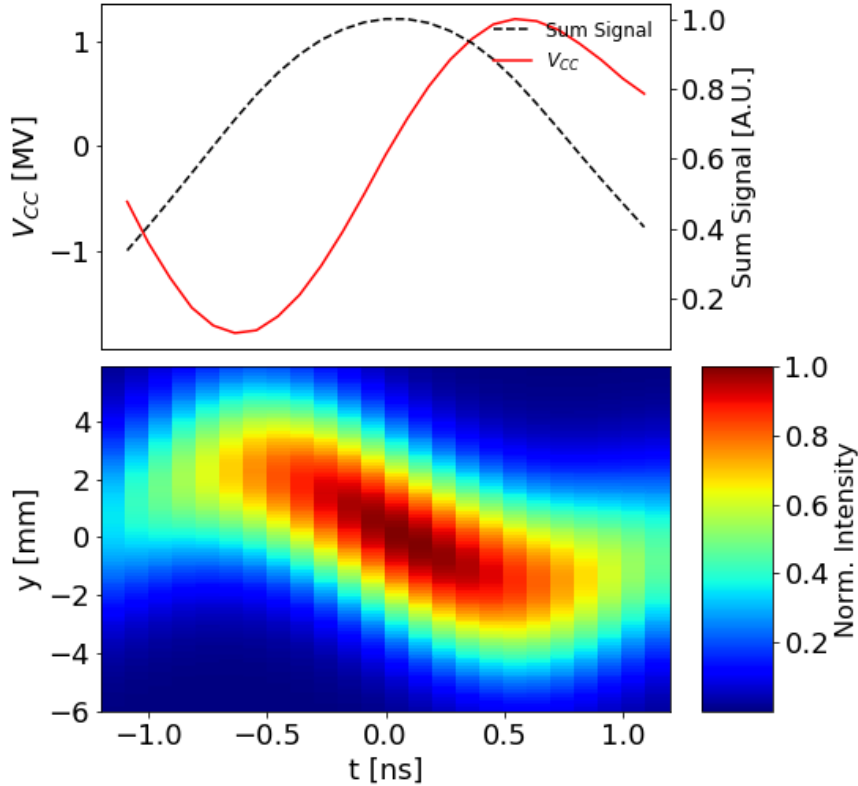


- Good control of the voltage of cavity 1, loops are all working - possibility to vary the phase of the cavities independently. Cavity 2 still with issues, therefore kept at 10W (~20kV).
- Ran with **intensities up to 1-1.2e11** without negative effects on the crab cryo/vacuum/rf.
- Vertical orbit bump at the location of the crab cavities between -5mm and +5mm to **determine electrical center**.
- Phase scan for cavity 1 with the voltage at ~1MV for **phase calibration** for this cavity.
- A few tune crossings for the **closest tune approach** measurement (to be processed offline). This was done for 1.25mm, 1.25mm+4mm and 1.25mm-4mm to see if there was a difference.
- Ramped **3e10 ppb to 270GeV**. With the crab cavity 1 at 1 MV right from injection the beam was lost soon after the start of the ramp – probably due to SBR. Switching the cavity on only after reaching flat top, successfully able to ramp and circulate the bunch at 270GeV.

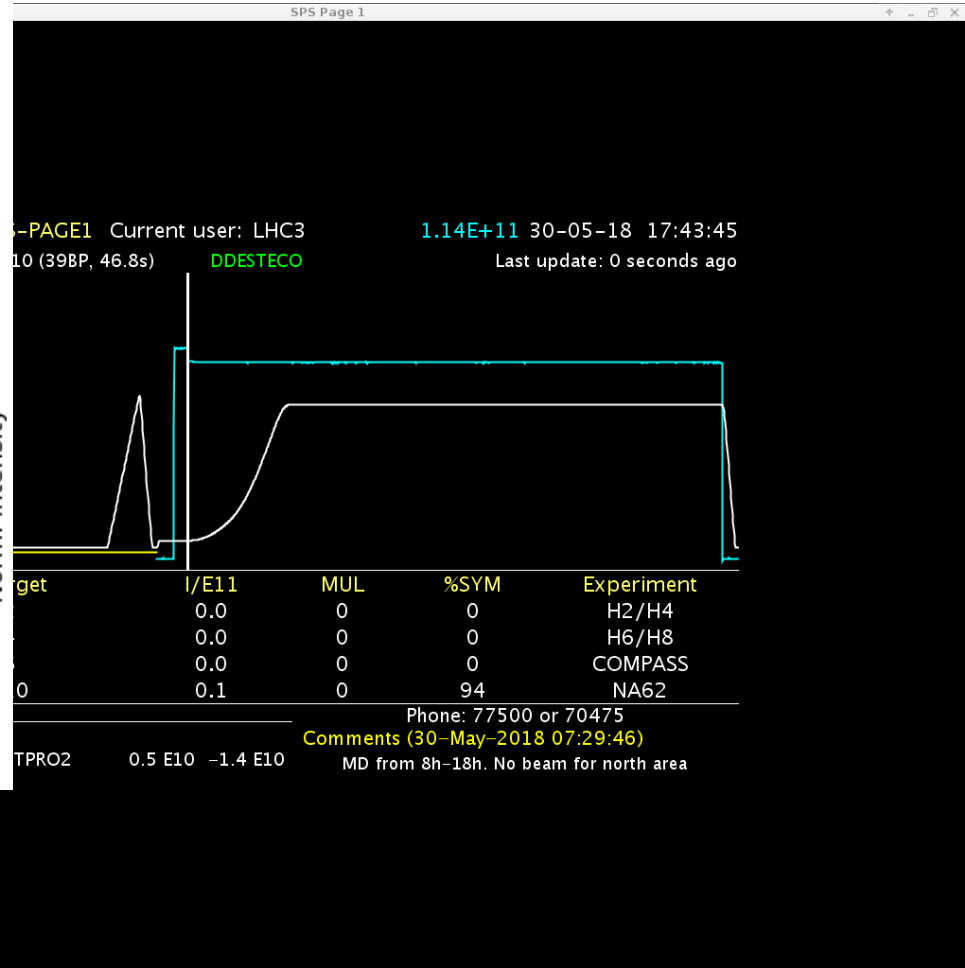
Crab cavity MDs



Crabbing Voltage from Head-Tail Monitor
2018-05-30 12:20:04



loops are all working - possibility to vary the cavity 2 still with issues, therefore kept at 10W

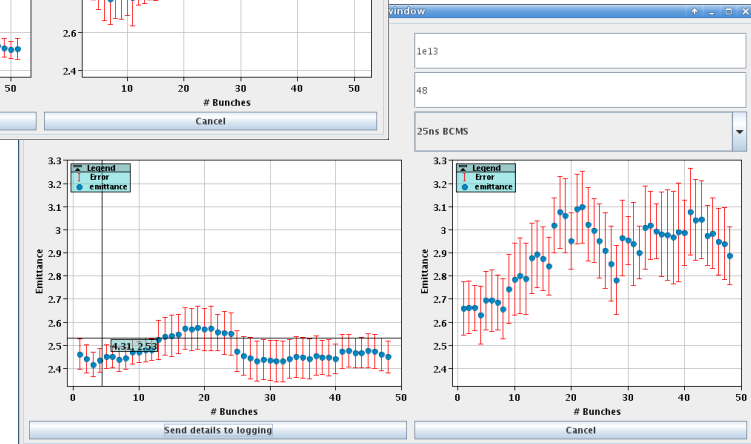
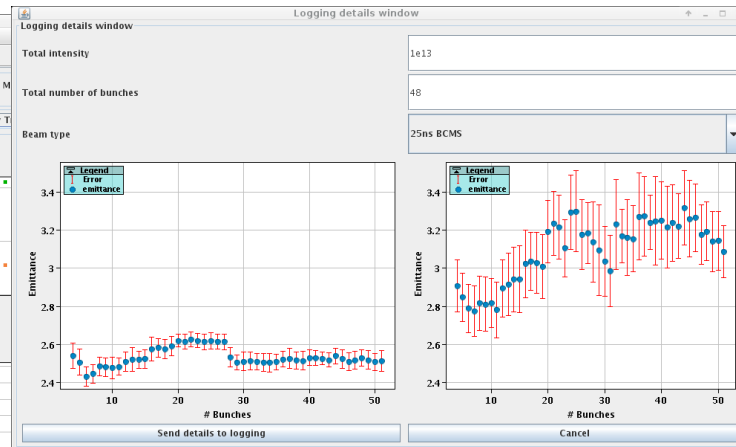
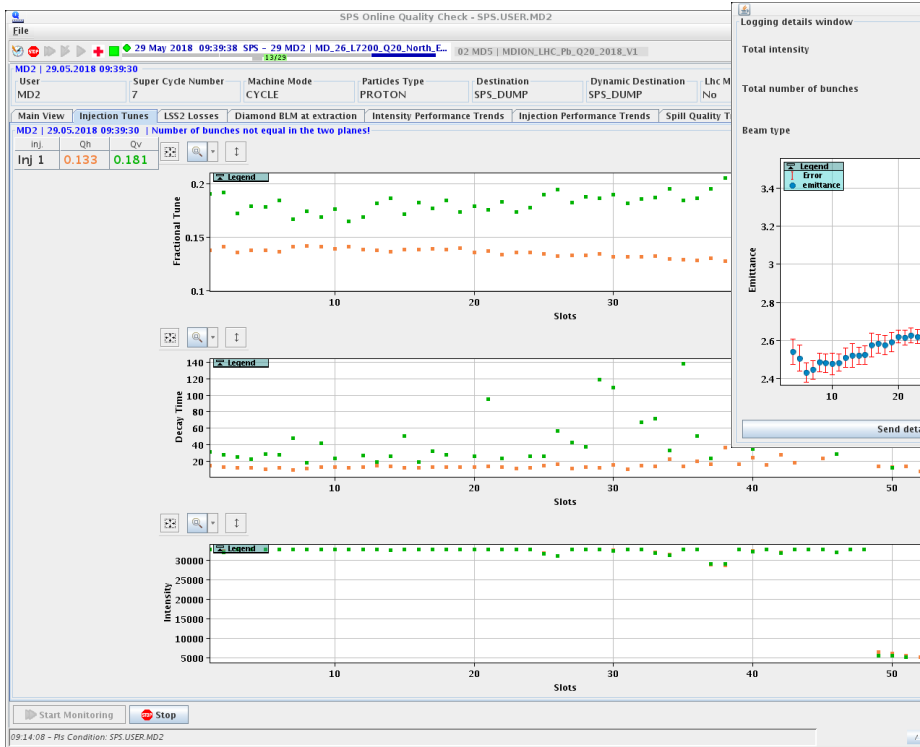


L. Carver et al.

High intensity beams



- 48 bunches up to 2.1×10^{11} ppb taken on LHC50NS
- Laslett tune correction working well
- Bunch by bunch tunes more or less flat
- Strong **blow-up observed rather symmetrically** in both planes

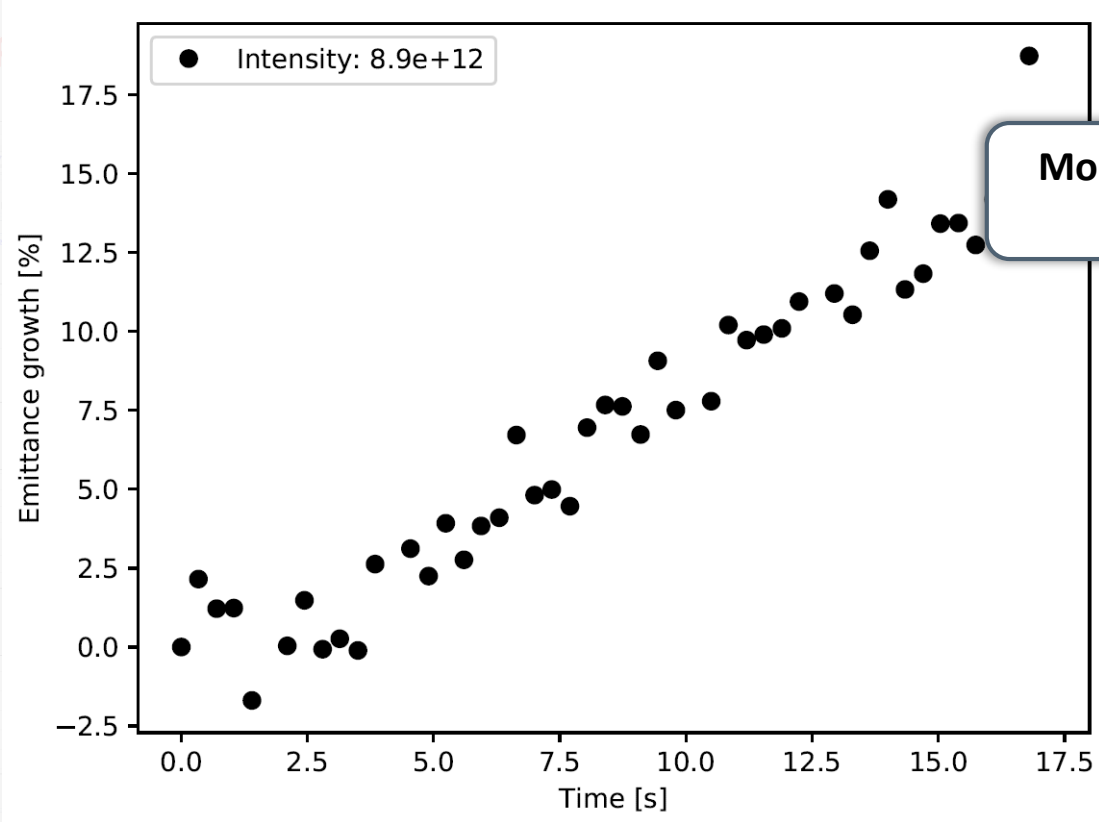


High intensity beams



- 48 bunches up to 2.1×10^{11} ppb taken on LHC50NS
- Laslett tune correction working well
- Bunch by bunch tunes more or less flat
- Strong **blow-up**

Measurements take from the BGI.



More scrubbing likely needed!



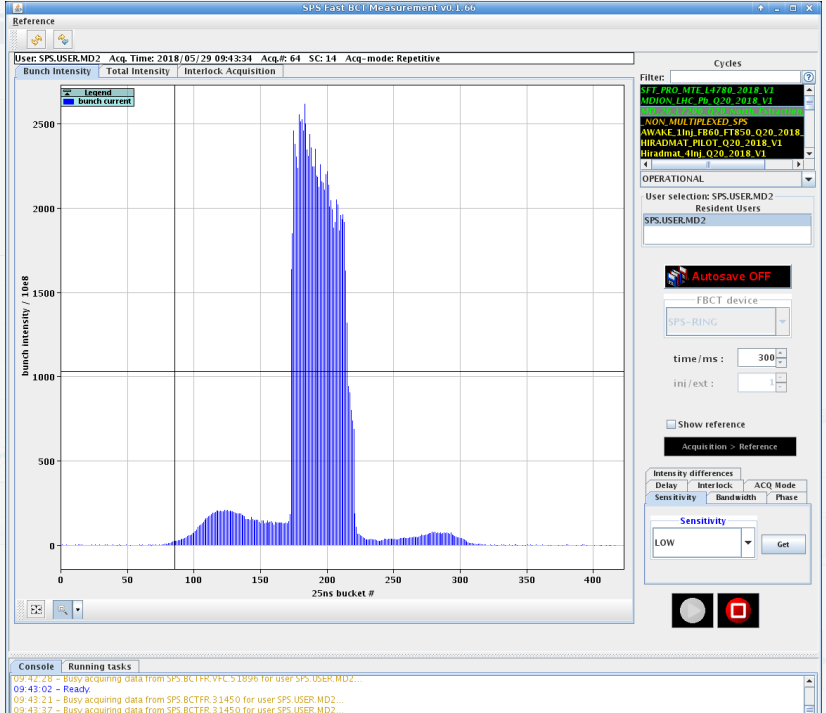
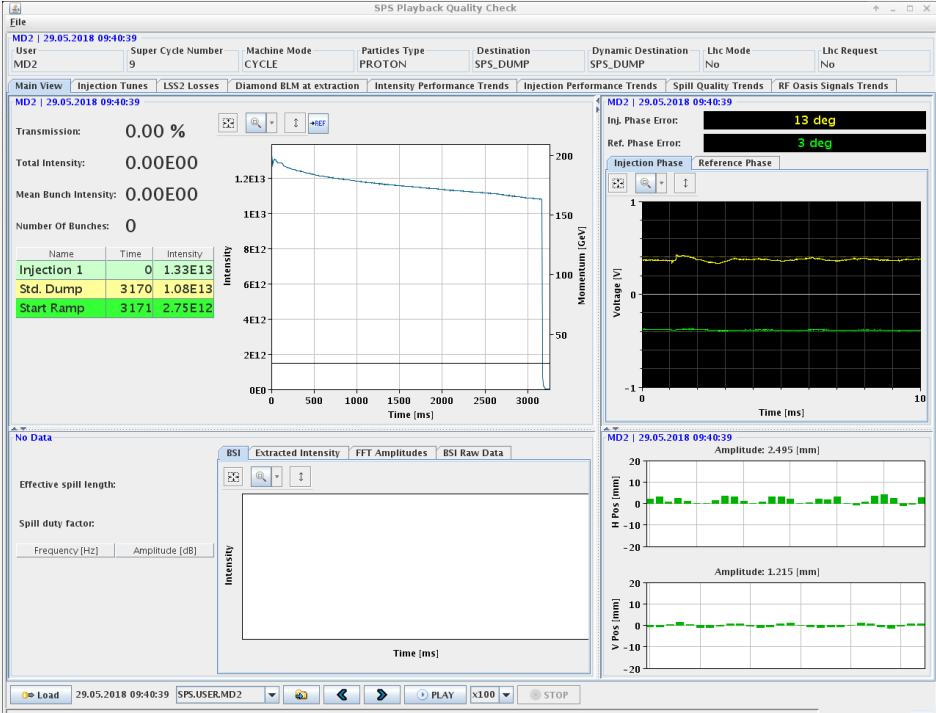
M. Carla

High intensity beams



- 48 bunches up to 2.1×10^{11} ppb taken on LHC50NS
- Laslett tune correction working well
- Bunch by bunch tunes more or less flat

On Tuesday on MD2, we managed to inject 2.8×10^{11} ppb!



Ions



- Nominal taken last week and longitudinal setup done.
- Early is taken this week with longitudinal setup ongoing.



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Status of beams



```
Hiradmat_4Inj_Q20_2018_V1
MD_26_L60_Q20_2018_V1
SFT_PRO_MTE_L4780_2018_V1
AWAKE_1Inj_FB60_FT850_Q20_2018_V1
HIRADMAT_PILOT_Q20_2018_V1
LHC25ns_4inj_Q20_2018_V1
LHCBCMS_3Inj_Q20_2018_V1
LHC_BCS_4inj_Q20_2018_V1
LHC_INDIV_Q20_2018_V1
LHC_PILOT_Q20_2018_V1
LHC_PILOT_Q20_2018_V2
MDION_LHC_Pb_Q20_2018_V1
MD_25.92_55_270_2017_V1
MD_25.92_55_270_North_Extr_2017_V1
MD_25.92_55_270_Q20_2017_V1
MD_26_L7200_Q20_North_Extraction_2018_V1
MD_26_L7200_Q26_North_Extraction_2018_V1
MD_CRAB_26_270_L30000_Q26_2018_V1
MD_CRAB_26_L26400_Q26_2018_V1
MD_SCRUB_26_L26400_Q20_2017_V1
SFT_PRO_MD_aperture_2017_V1
SFT_PRO_MTE_L4780_2018_V2
```

- SFTPRO – eee
- LHC – BCMS
- LHC50NS
- MD