
CERN

Another run is over and LS2 has just begun… ♪♪♪♪

Rende Steerenberg – BE/OP

FOM in Google

FOM

FIGURES OF MERIT

The FOM Mandate

The FOM is responsible for overseeing the operation of the non-LHC accelerator complex and associated experimental areas. Specific responsibilities include:

- Establish and maintain short-term and long-term accelerator schedules;
- Planning and coordination of cold check-outs, accelerator start-ups and all periods of beam operation;
- Review regularly the performance of all operational beams, in order to ensure optimum performance and the best possible conditions for all users;
- Implement developments to improve the performance of operational beams;
- Report major technical problems, which affect operation, to the IEFC;
- Regularly report to the BEMB.

Number of FOM Meetings per Year

FOM Composition

- The FOM is driven by:
  - FOM Chair persons and Scientific secretaries;
  - Physics coordinators
  - Experimental representatives
  - A team of machine supervisors/coordinators of around 65 people from 13 machines/facilities
  - The participation of many equipment specialists and/or representatives per group

It is a very constructive meeting and allows operational follow up on issues and plan beam deliveries

MANY THANKS TO ALL INVOLVED

Machine Availability

- AFT was deployed in the injectors at the start of 2016 and additional functionalities were added later
- The data quality relies on the machine supervisors/coordinator who review all faults every week

Facility	2015	2016	2017	2018
LINAC2		97.3%	99.1%	99%
LINAC3			99.8%	95.1%
PSB	94.3%	94%	97%	95.0%
PS	93.2%	90.4%	93.4%	90.2%
SPS	87.3%	76.2%	91%	80.4%
AD	90%		~95%	64.4%

Personal

Non-exhaustive list of

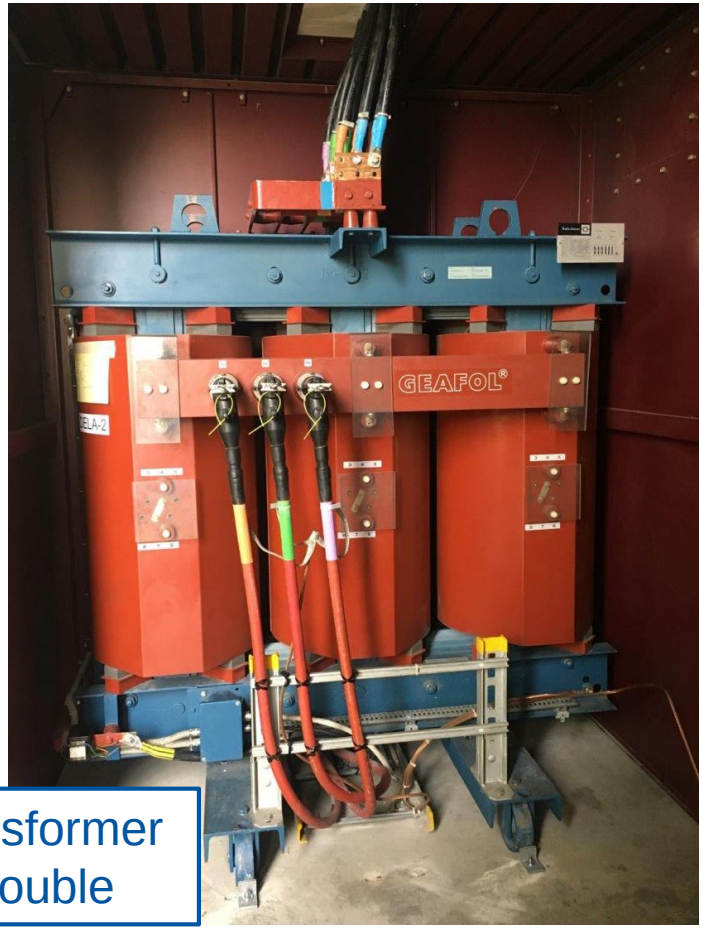
Highlights

TI – Major Events

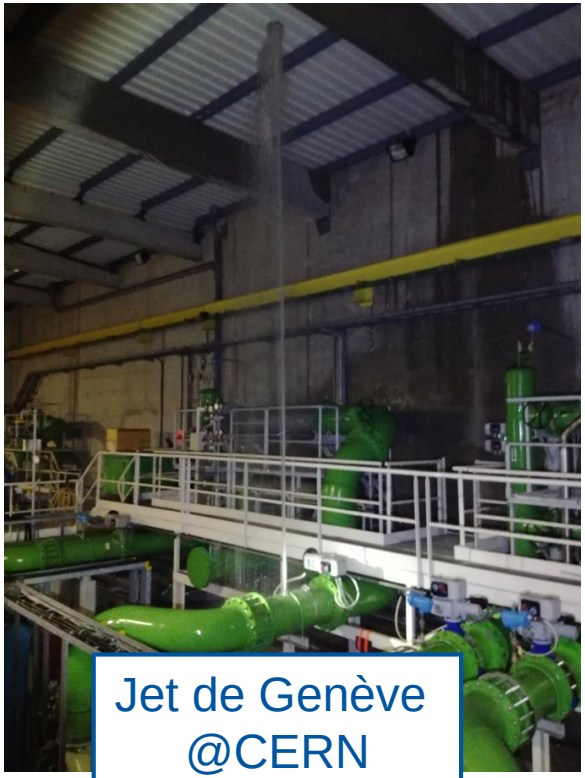
2018: 96 Major Events – 25 Electrical Perturbations

2017: 61 Major Events – Only 19 Electrical Perturbations

Return of the weasel



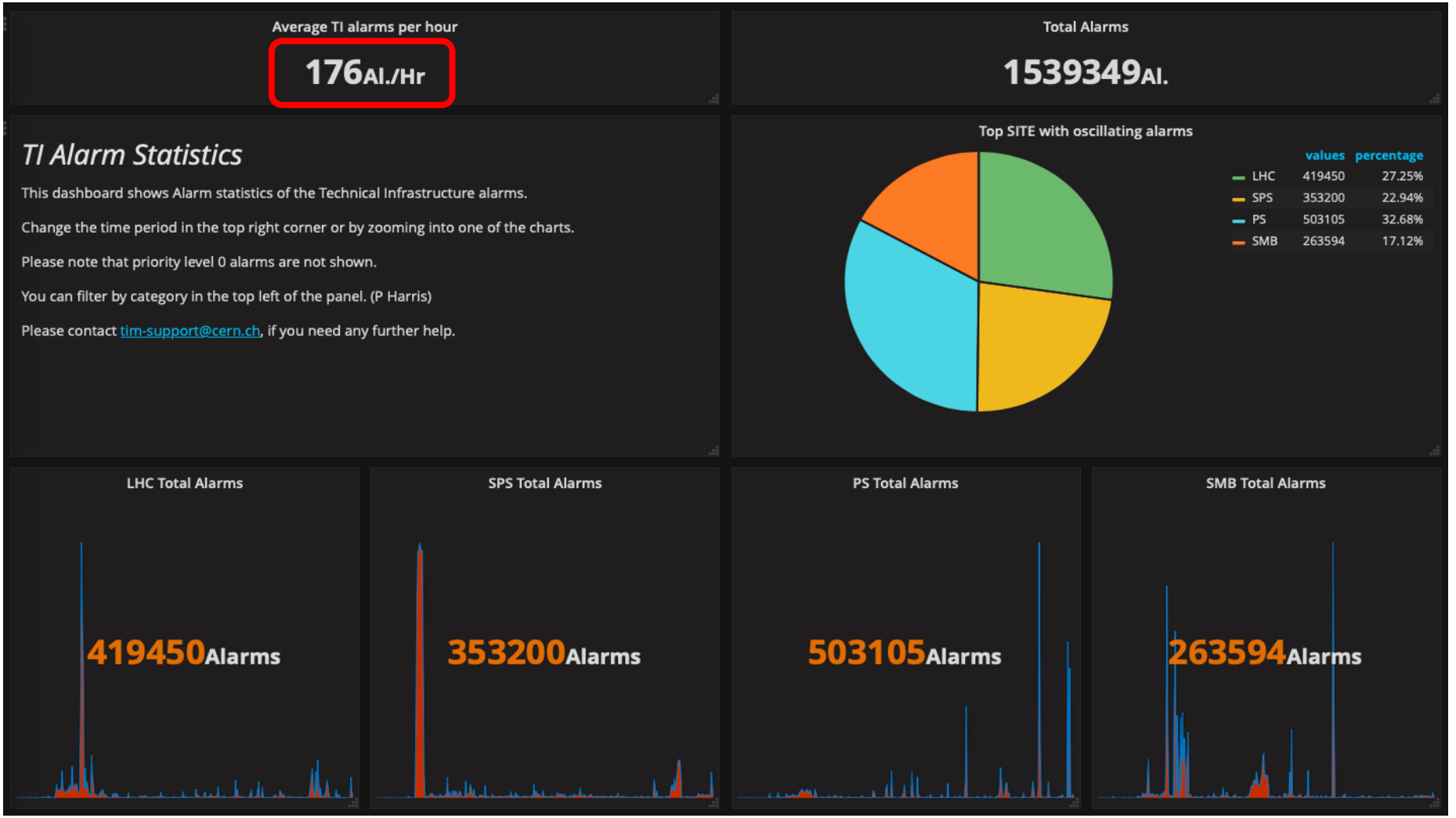
Transformer trouble



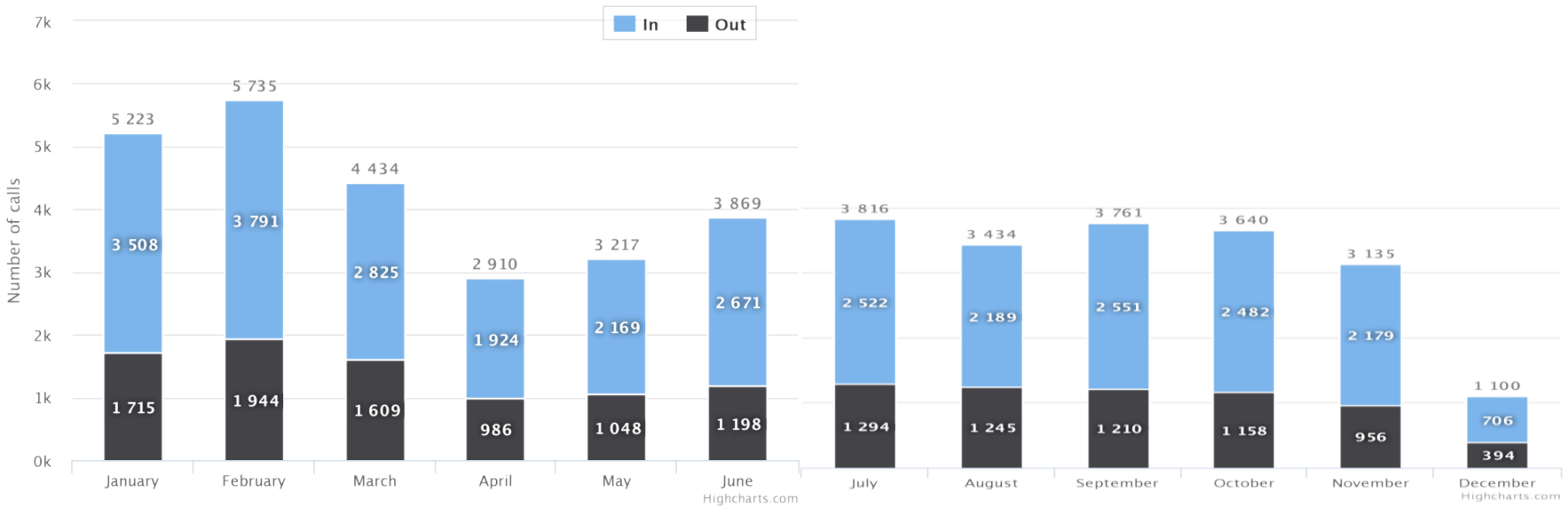
Jet de Genève @CERN

Wet winter !

TI


Average TI alarms per hour
176Al./Hr
Total Alarms
1539349Al.
TI Alarm Statistics
This dashboard shows Alarm statistics of the Technical Infrastructure alarms.
Change the time period in the top right corner or by zooming into one of the charts.
Please note that priority level 0 alarms are not shown.
You can filter by category in the top left of the panel. (P Harris)
Please contact tim-support@cern.ch, if you need any further help.
Top SITE with oscillating alarms
values percentage
LHC 419450 27.25%
SPS 353200 22.94%
PS 503105 32.68%
SMB 263594 17.12%
LHC Total Alarms
419450Alarms
SPS Total Alarms
353200Alarms
PS Total Alarms
503105Alarms
SMB Total Alarms
263594Alarms

TI



47’319 phone calls in 2018 → ~ 130 phone call per day

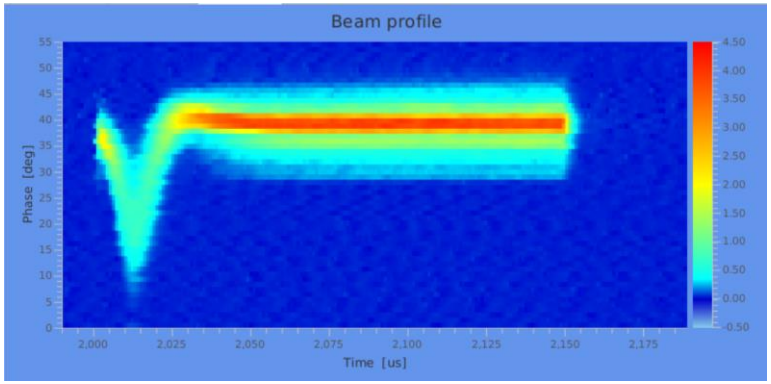
1’539’349 alarms in 2018 → more than 4200 alarms per day

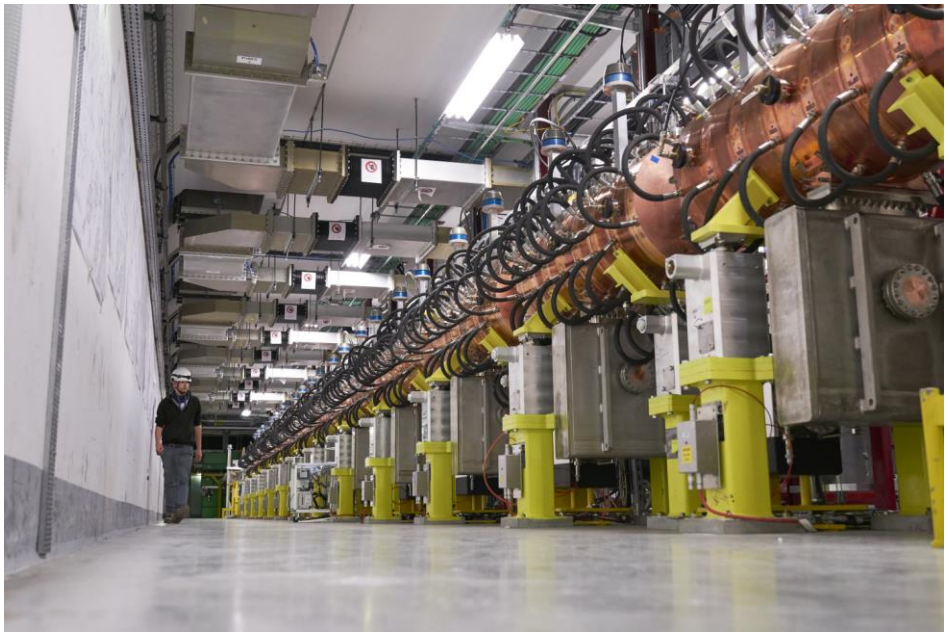
From LINAC2 towards LINAC4

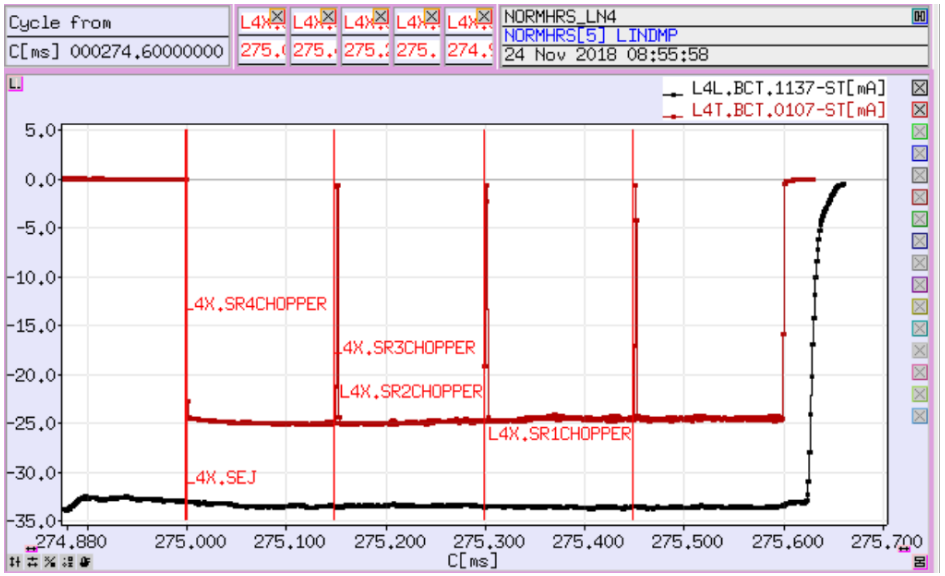
LINAC 2 retired at the age of 40 on 12 November 2018

LINAC 4

Two very useful and interesting reliability runs took place in 2018



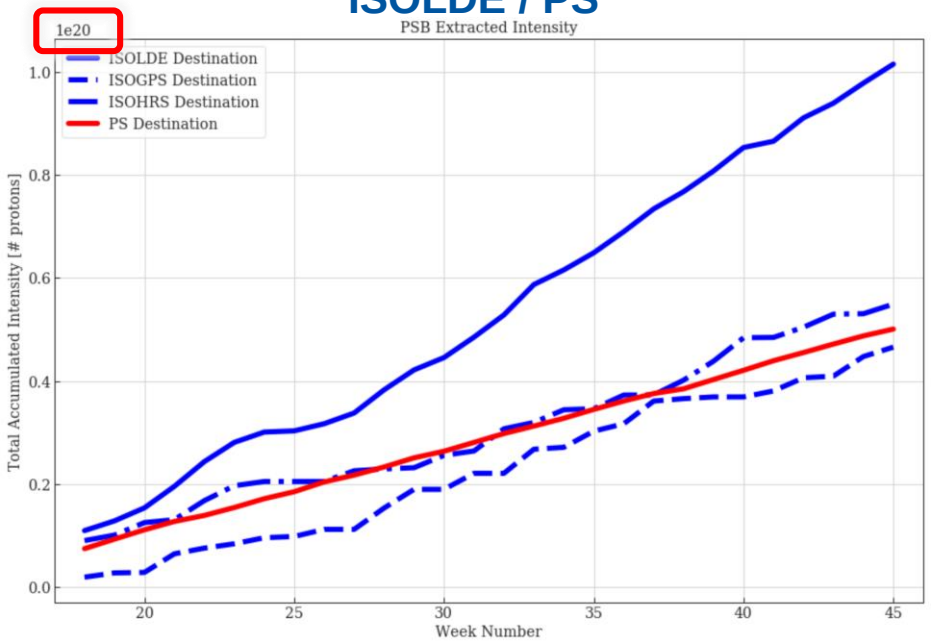




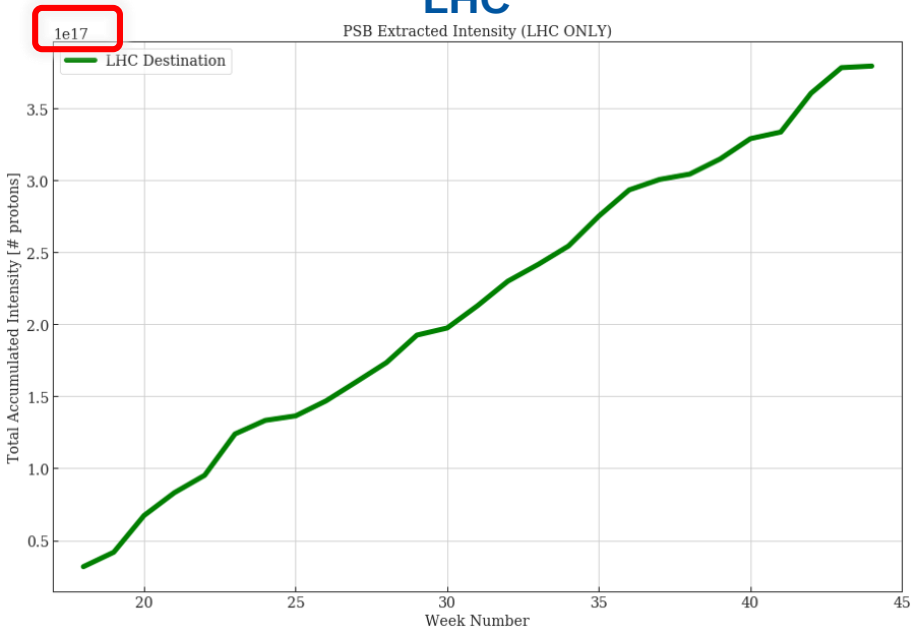
Important advancements both in machine reliability and beam quality were made

PSB Beams for the Users

ISOLDE / PS



LHC

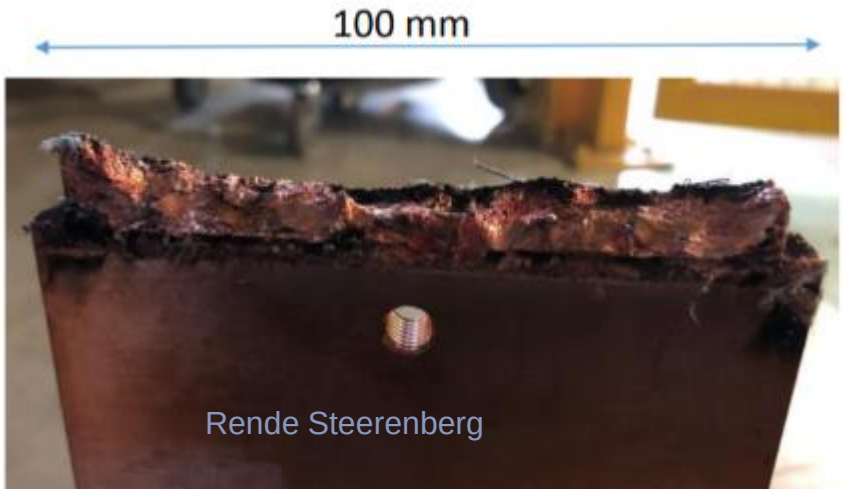


- PSB delivered **>1e20 p** to **ISOLDE**
- **~half** to the **PS** for ALL downstream experiments/machines
- **>1e19 p** to **PSB dump** for MDs and beam setting up

- Only **~3.8e17 p for LHC** (graph for all LHC beams at SPS injection…) → **<0.2% of all protons extracted from PSB were sent to the LHC!**

Injection septum failure

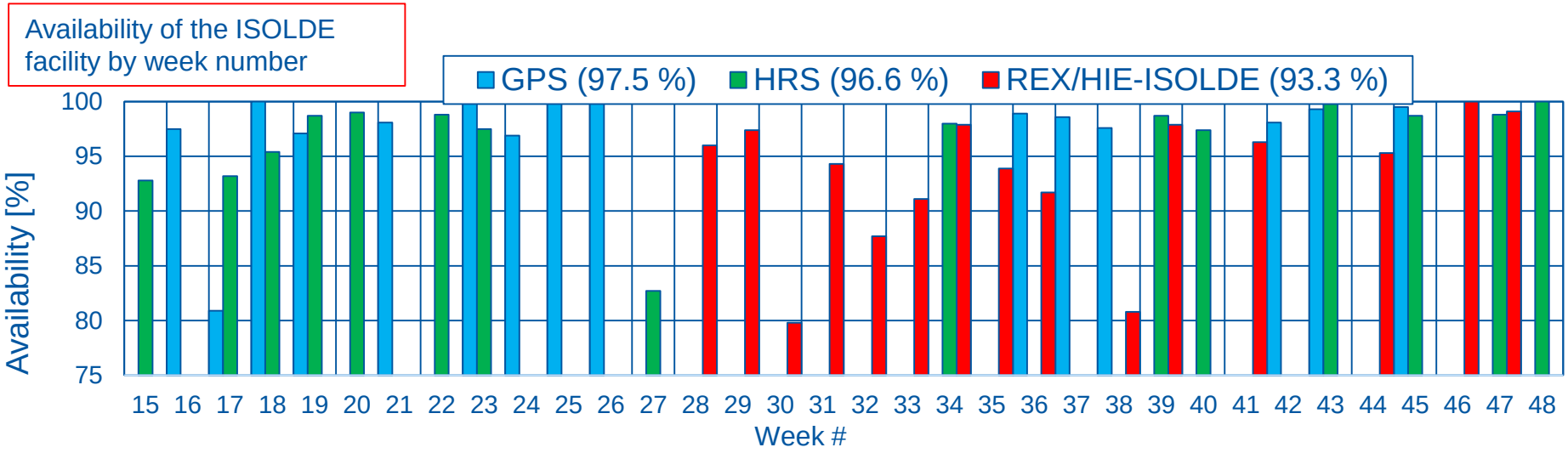
- Stripline short circuit
- Downtime 17h
- Cracked insulator -> loose cable
- 34kA normally
- Repairs were made, but delayed due to....



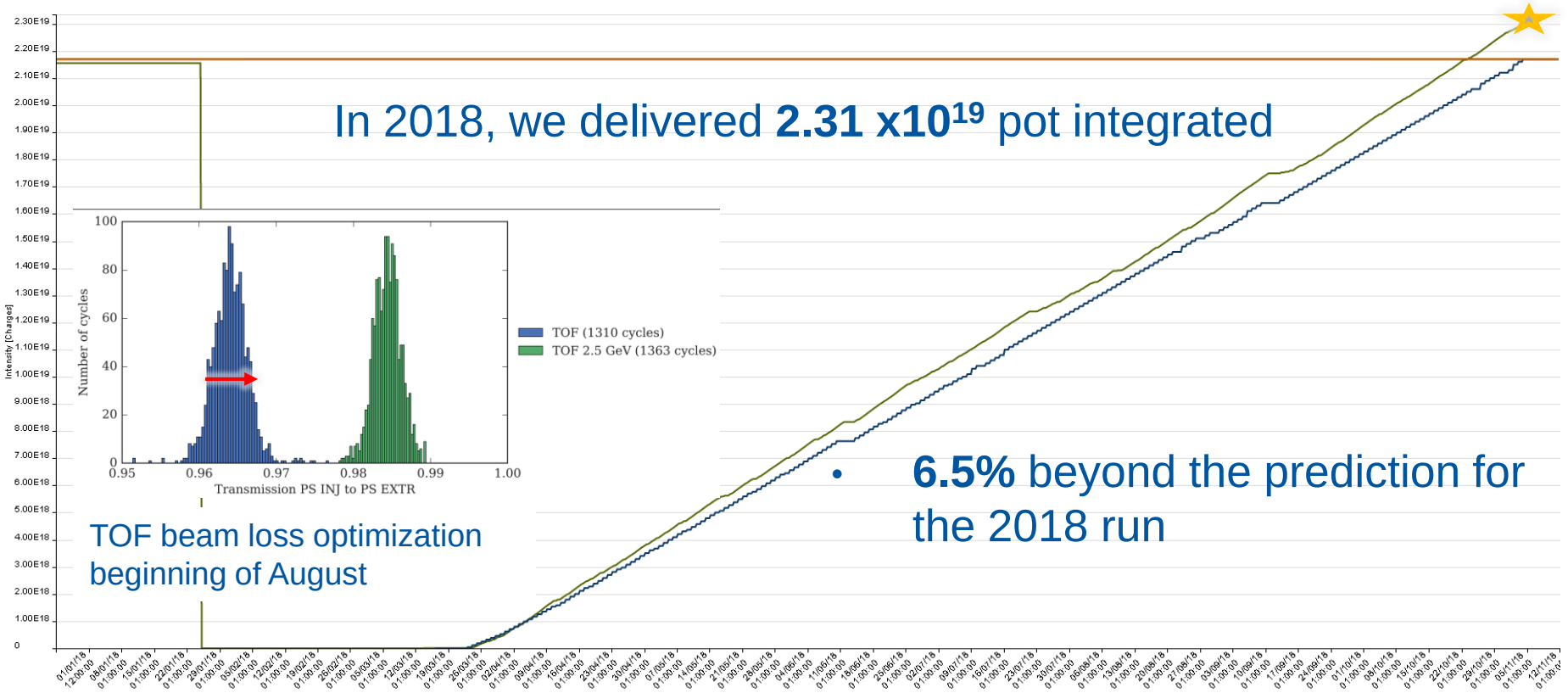
ISOLDE Highlights

The 2018 Operation and Physics campaign:

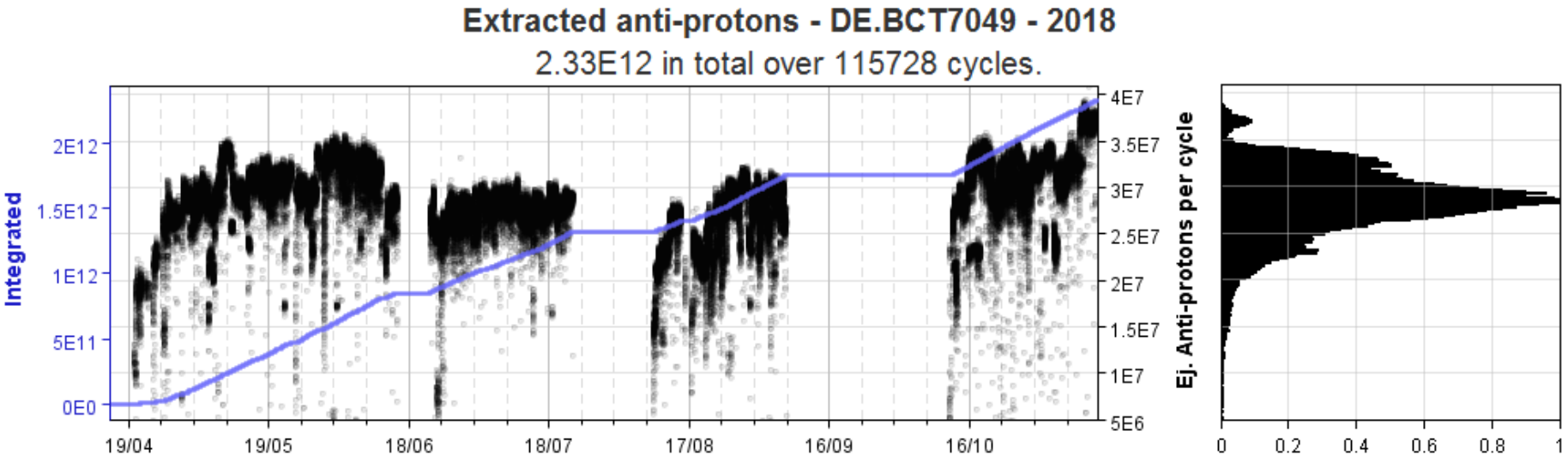
- Facility start-up and beam re-commissioning in March
- Low energy Physics during the first part of the year (wk. 15-28)
- Interleaved low and high energy Physics since wk. 28
- Two additional experiments completed after protons stopped using long-lived isotopes extracted from pre-irradiated targets (wk. 46-48)
- Important contributions to the operations of MEDICIS



nTOF **final** #protons on target 2018

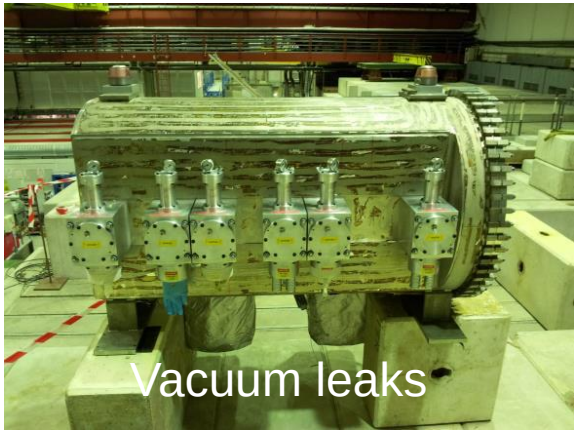


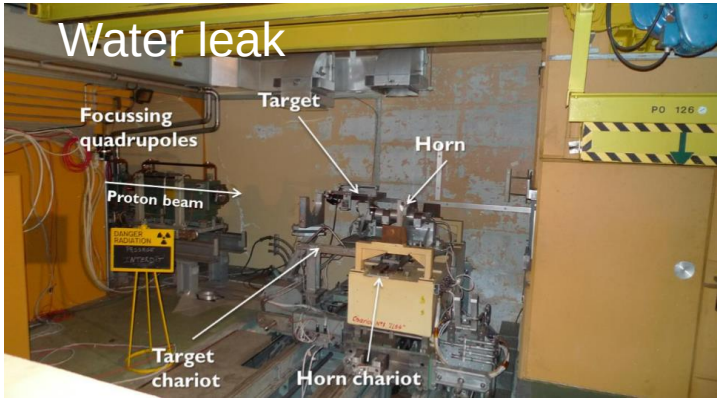
AD Highlights



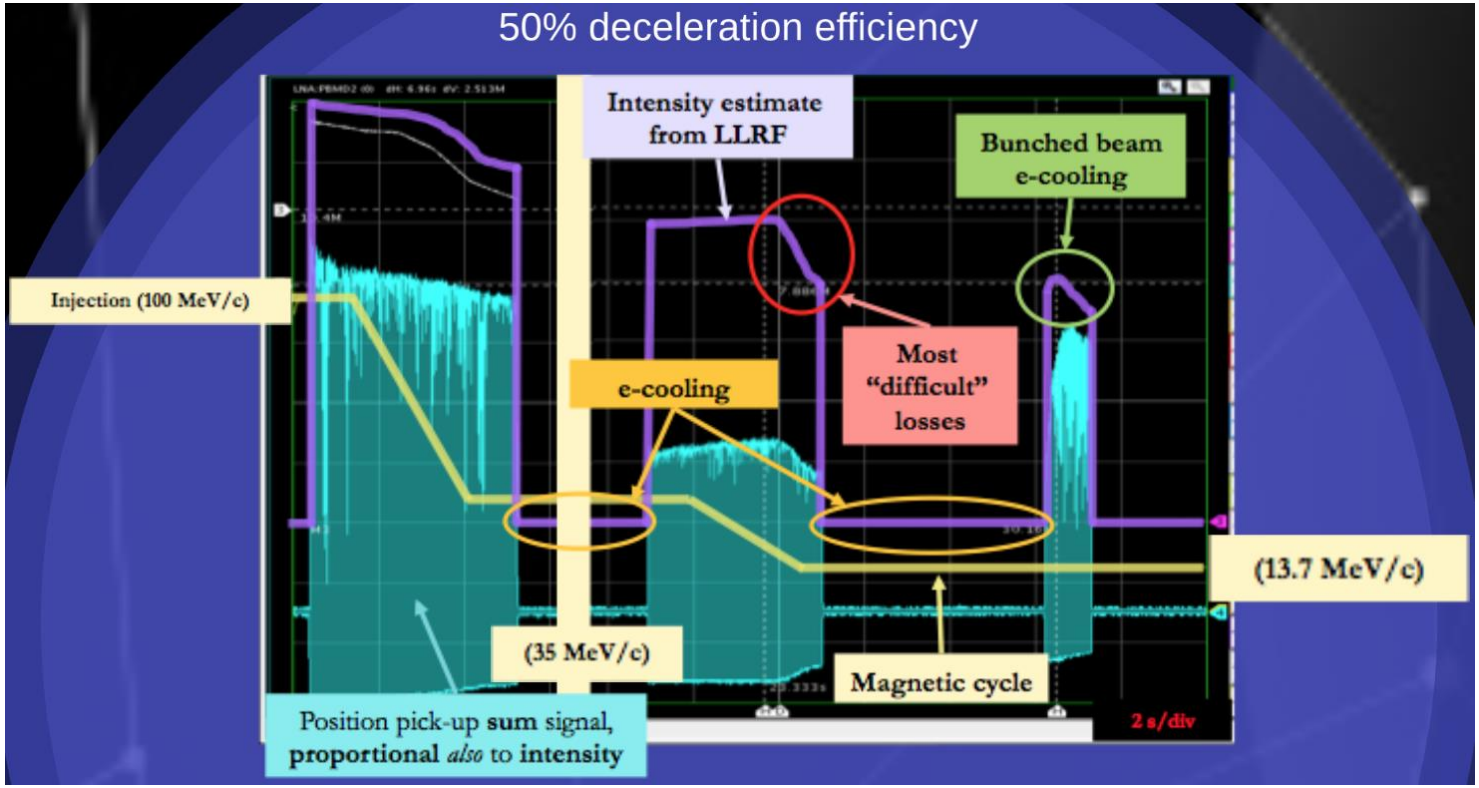
- Operation was hampered much by several problems
- Between long down-time periods, stable conditions with good transverse and longitudinal emittances
- Excellent performance during the last weeks (full proton intensity on target after water cooling issues during the year)
- Heavy consolidation activities planned for LS2 !

AD: A troublesome year





ELENA: Commissioning

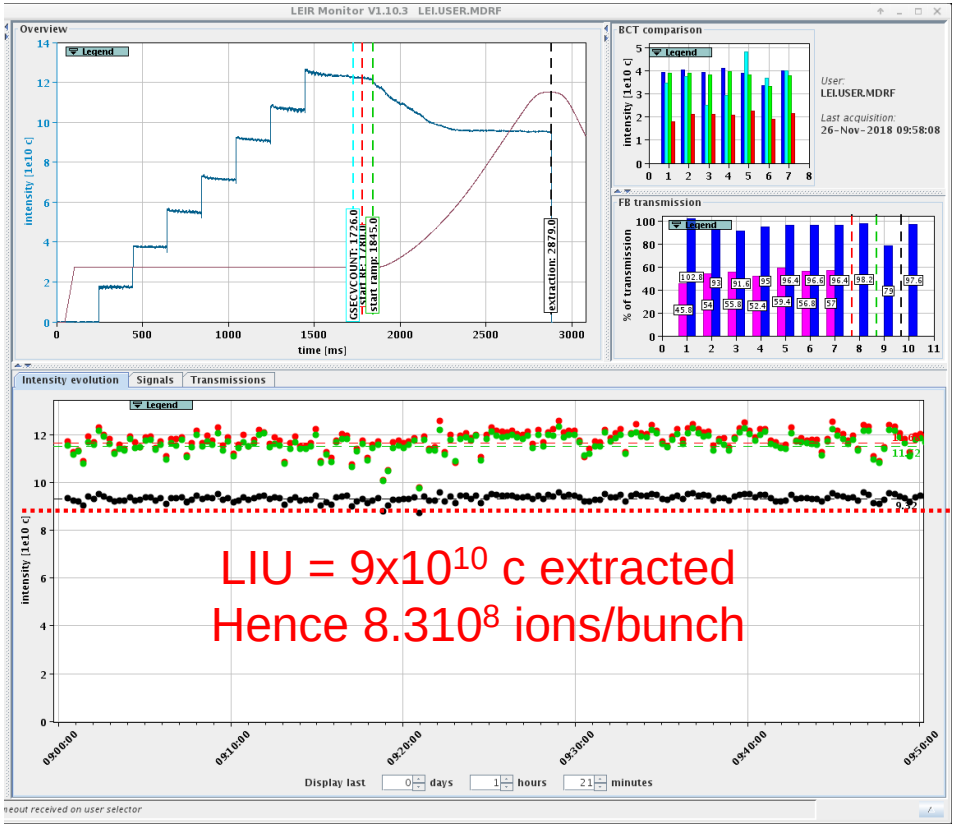


- Despite many issues with the local ion source and the AD the commissioning advanced well
- Antiprotons were send to GBAR on 20 July
- Users ready for new transfer lines from ELENA

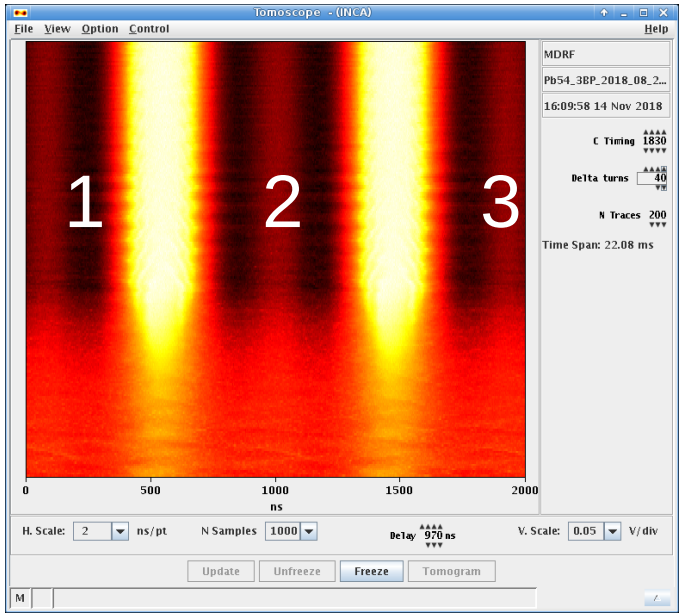
LINAC3 - LEIR

3 bunches – 75 ns

higher bunch intensity, more bunches for LHC



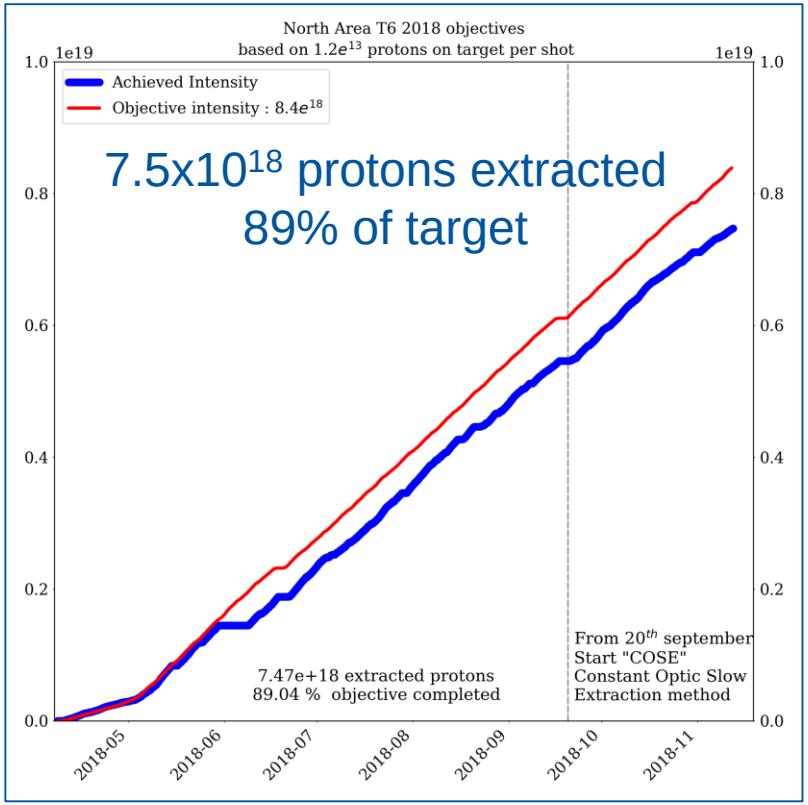
3 bunches from LEIR + 75 ns (in PS)



2018 OPERATIONAL beam to LHC in the complex

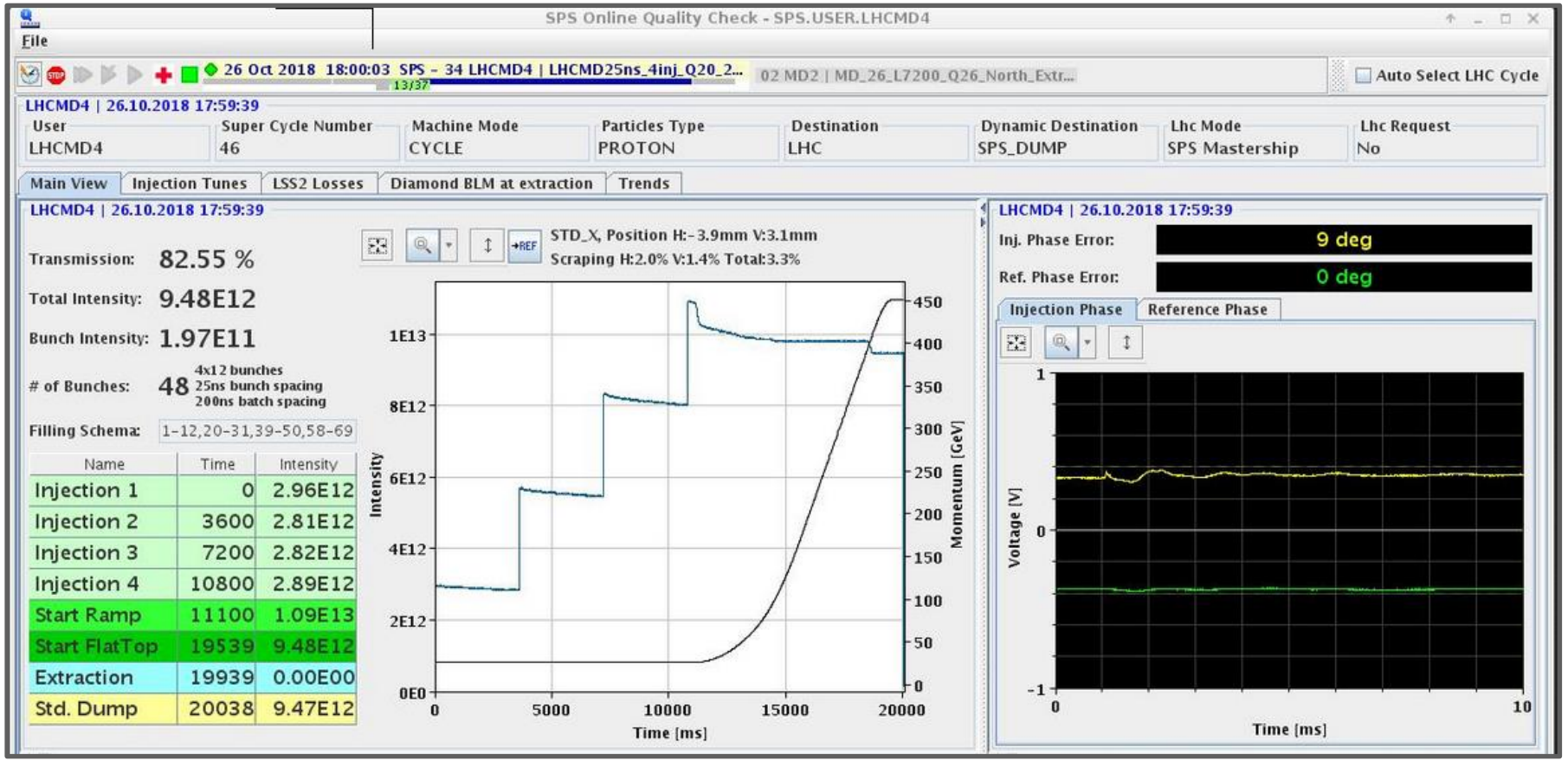
SPS North Area Beam on T6

- Too many long lasting stops of NA beam:
  - MBE2103 auto-transformer North Area
  - ZS 4 broken high voltage feed-through
  - ZS short in high voltage cable
  - Beam induced vacuum leak
  - Major power cut of 3 December
- Objectives for 2018 could not be met
- Average availability SPS 2018: 80.4 %



SPS: LHC beam toward LIU Intensities

BCMS 12 bunch trains; 2×10^{11} ppb @ extraction



A big thanks to everyone

Merry Christmas

&

Happy LS2

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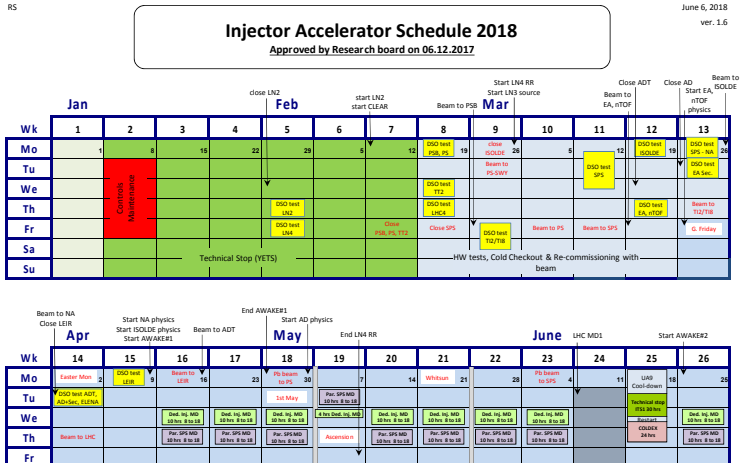
New Accelerator Schedule Management Tool

- Until 2018 inclusive the Excel based schedules were used



- In the future this will be replaced by a more modern, accurate and on-line tool: ASM