Coherent Effects and Impedances section (CEI) – general information

Giovanni Rumolo

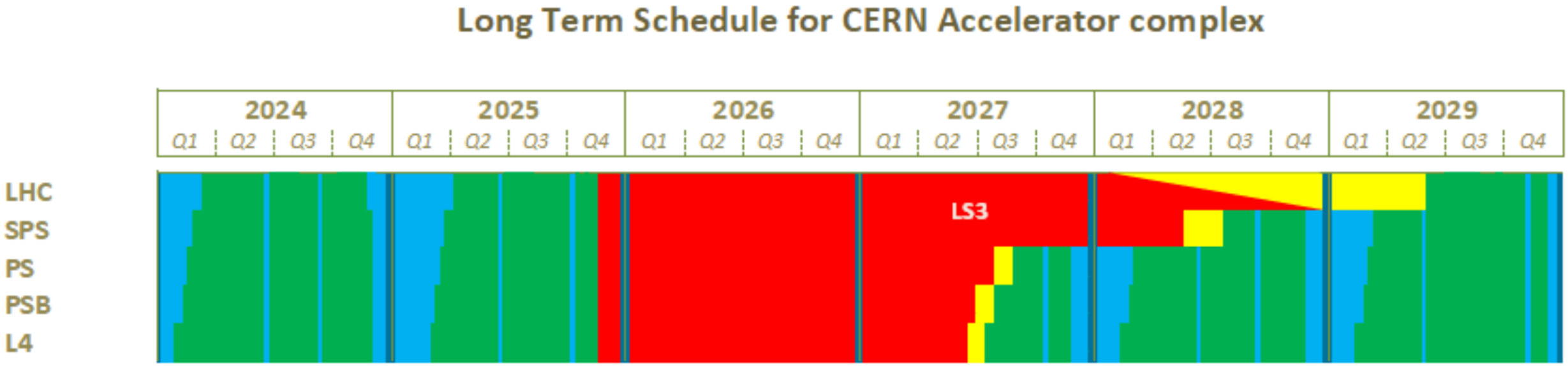
CEI Section Meeting, 15/08/2024

Scientific secretary: Lorenzo Giacomel

https://indico.cern.ch/event/1439355/

Arising matters

- LS3 extension?
  - At the moment, LS3 is planned to start in November 2025 for the whole CERN accelerator complex and last till mid-2027 for PS complex, mid-2028 for SPS and mid-2029 for LHC



Arising matters

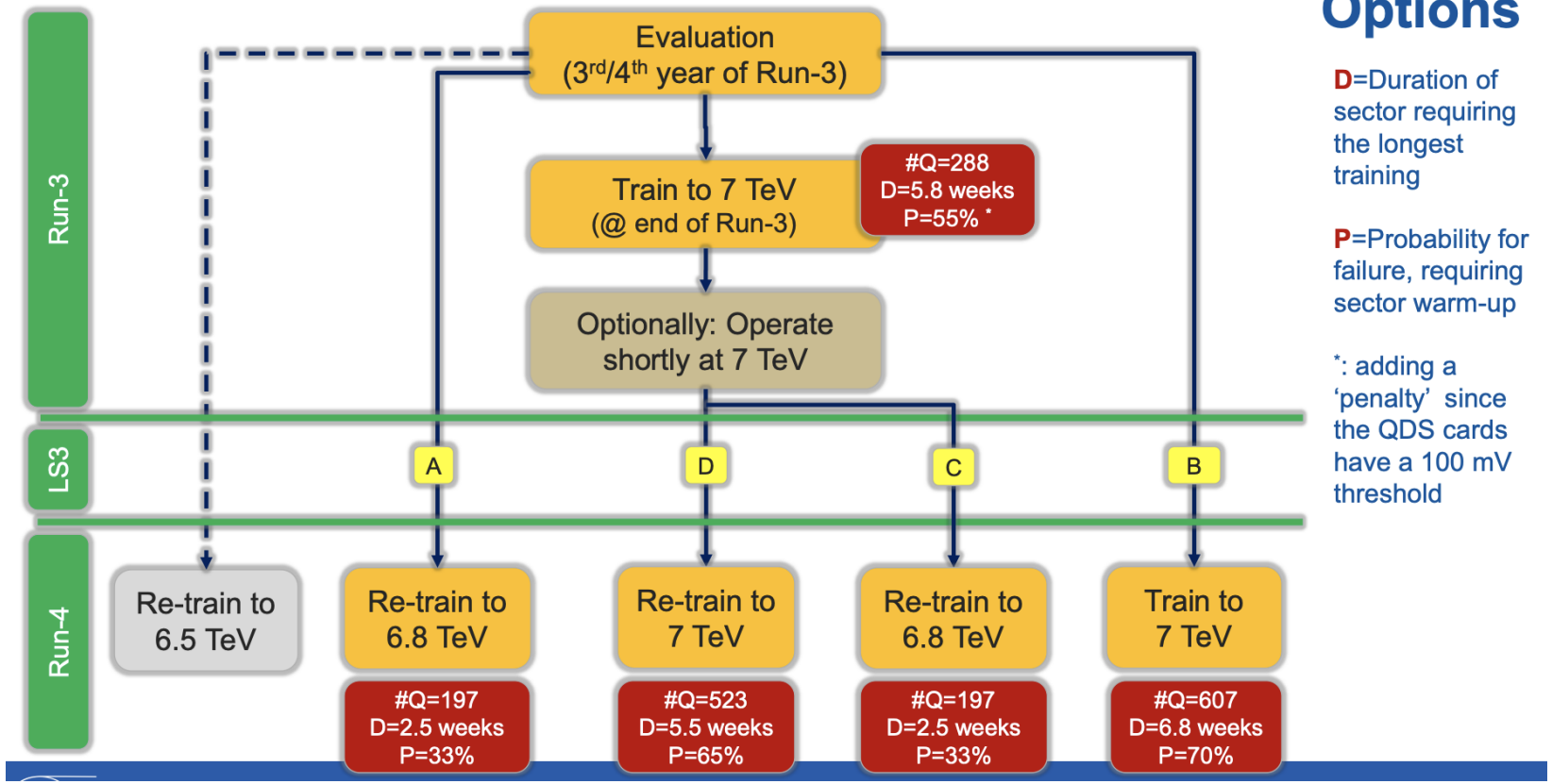
- LS3 extension?
  - Two new important ingredients from HL-LHC
    - Extension of the allocated time for the core drilling (vertical cores to be excavated in LS3 between the new HL-LHC galleries) from 2 month to 6 months
    - The most recent schedule analysis for LS3 activities concluded that the LS3 length needs to be extended by approximately 11 weeks to accommodate previously unscheduled activities (i.e. CV piping replacement) or activities that require more time to be carried out (Minor Civil Engineering Works, DSL modification ,…)
  - All in all, the project is preparing a Schedule Change Request that asks for an overall extension of the LS3 length by 6 months (already discussed with the LS3 coordination team and presented to the ATS management)
  - The Schedule Change Request should get into circulation by next week
- Adding in the picture the possible delay of LS3 start (mid-2026?) – final decision expected in September 2024 – this might mean that HL-LHC beam commissioning will be pushed well into 2030!

1st CERN School of Computing on IT Services

- The 1st CERN School of Computing on IT Services will take place on November 4-8, 2024 in Ferney Voltaire, France. The school will be held at the Appart City hotel and is nonresidential
- It aims to empower CERN members of personnel to get the most out of the computing services delivered by the CERN IT Department to the physics community
- Recommended for any person that is using the CERN IT services either to deliver information, analyse data, automate tasks or work in engineering projects
- CEI list of potential candidates to attend? Needs to be sent out soon

News from LMC

- LHC@7 TeV for Run 4, or even earlier?

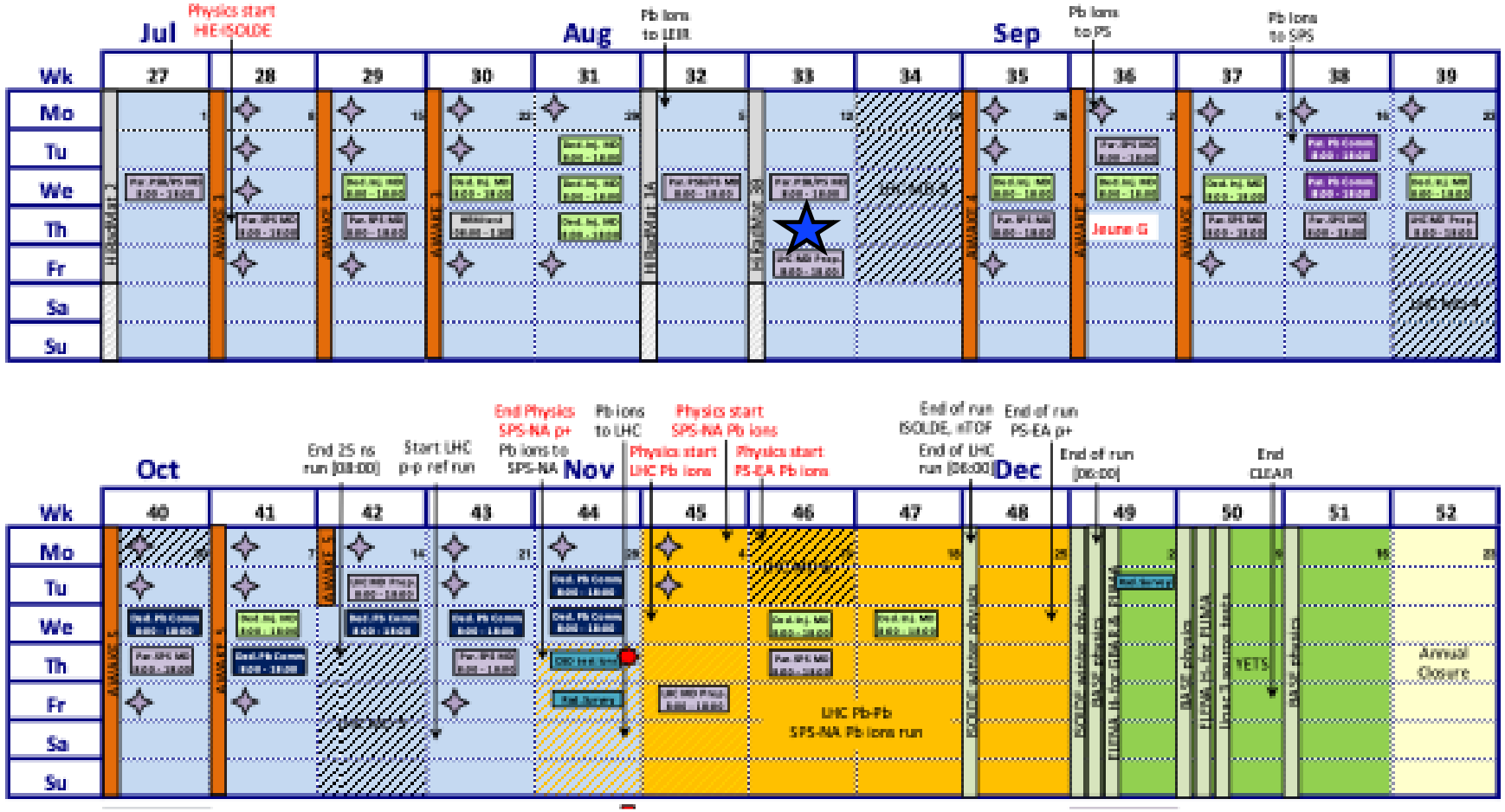


A. Verweij

News from LMC

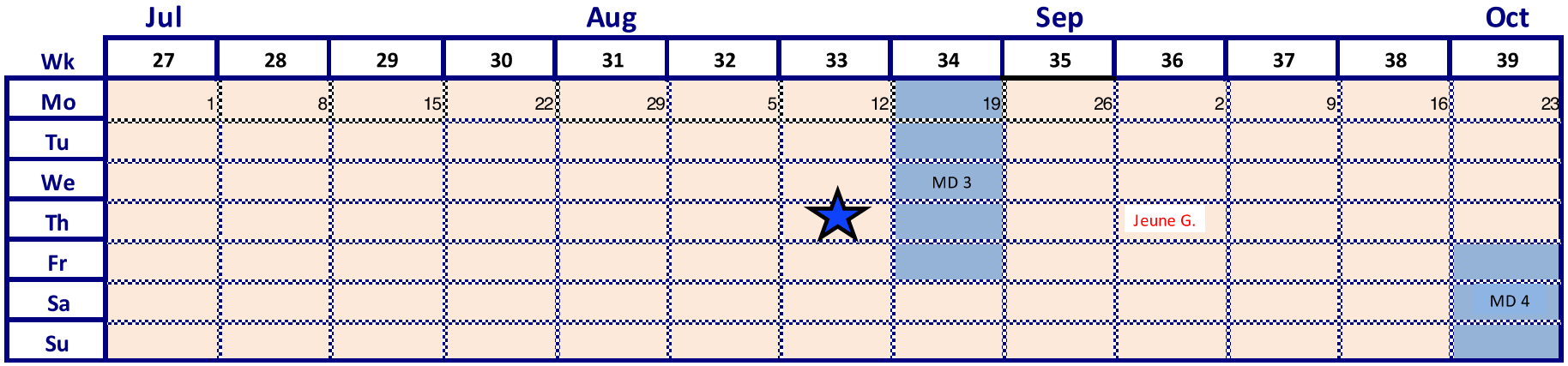
- LHC@7 TeV for Run 4, or even earlier?
- No decision taken, but:
  - Training before LS3 unlikely to happen
    - No sure benefit for post-LS3 retraining
    - Additional damage risk in case of quench from non-conforming by-pass diodes – to be repaired in LS3 and mostly not synergetic with BST
  - Running 7 TeV after LS3?
    - 100s quenches/>2 months training needed with high risk of breakage and +3.5 months delay
    - Uncertainty on other magnet circuits beyond dipoles
    - Probably reduced machine availability
    - HL assumes 6.8 TeV

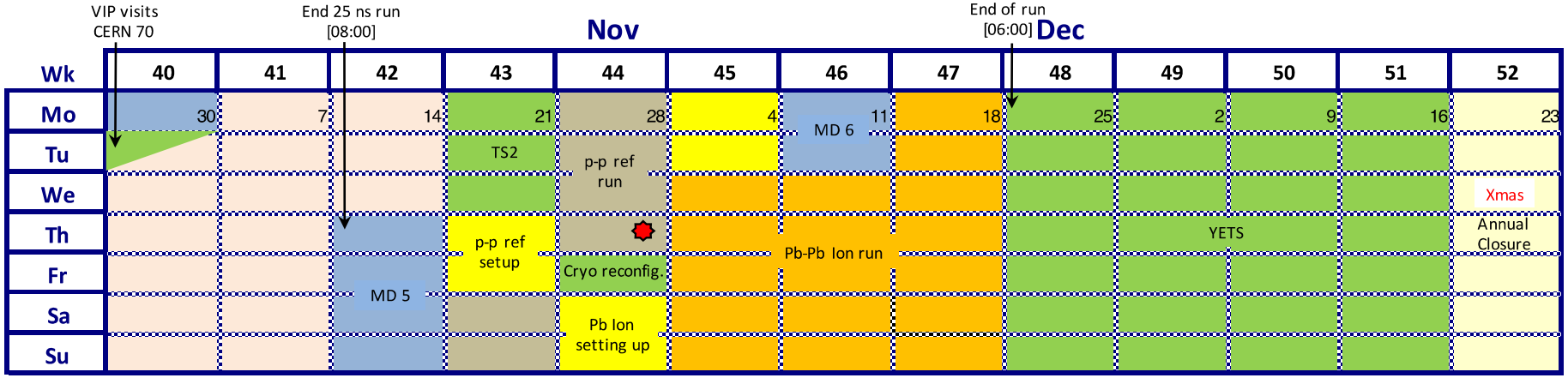
2024 injectors schedule v2.1



- No dedicated nor long parallel SPS MDs for three weeks due to HiRadMat run and then LHC MDs
- LHC MD prep started already last Friday
  - 2x 48b with 2.3e11 p/b and extractable to LHC produced, but with 10% larger emittance than LIU
  - Heavily scraped BCMS ready but only up to 1.9e11 p/b

2024 LHC schedule v2.0



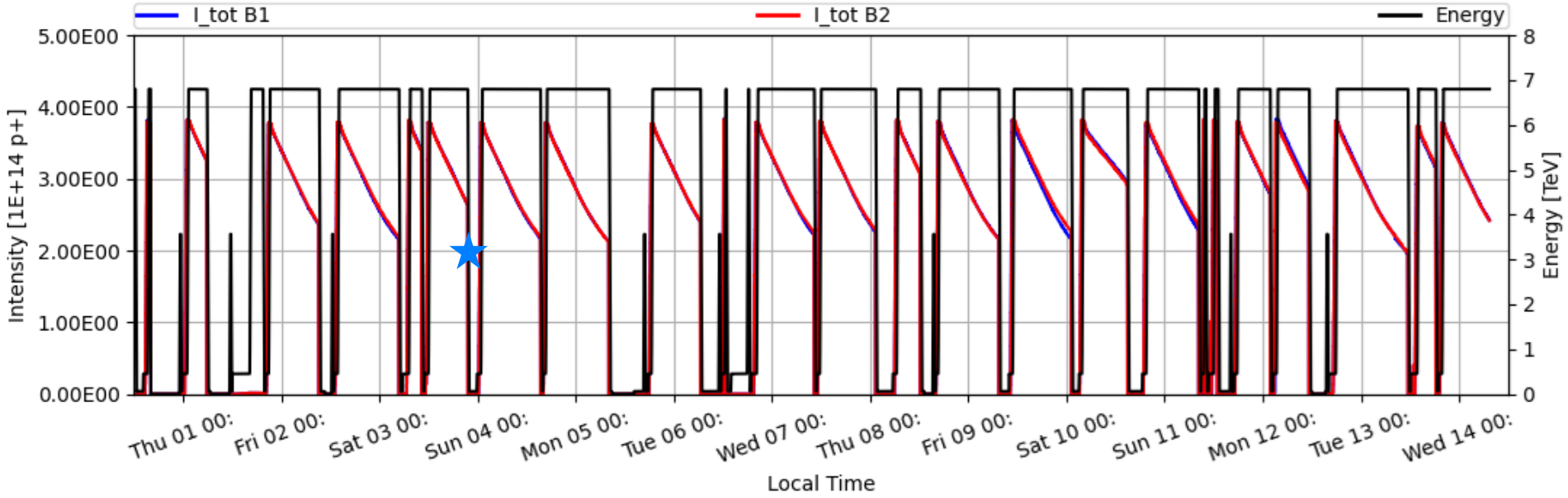


- Physics production with very good availability
- Next week MDs with some involvement from CEI

LHC Lumi

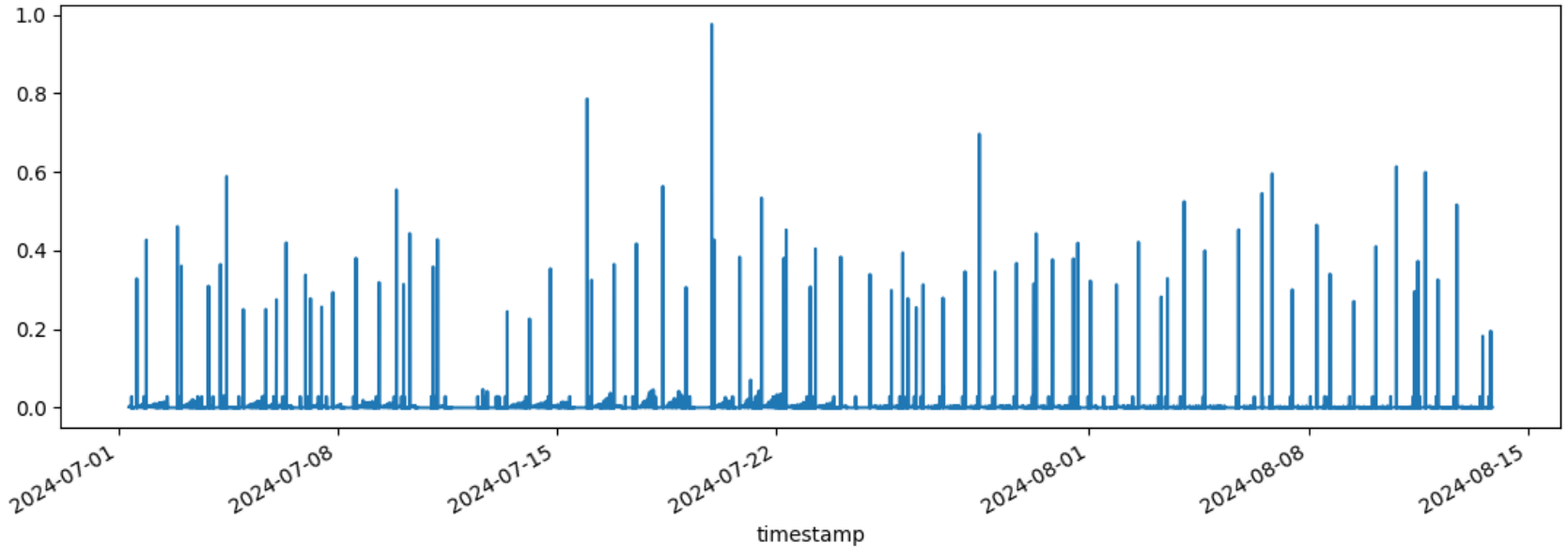
- Very good production period in last two weeks with high availability and large fraction in stable beams
  - High injector availability
  - Only one UFO dump ★

Availability	Stable beams (SB)
79.2%	63.3%



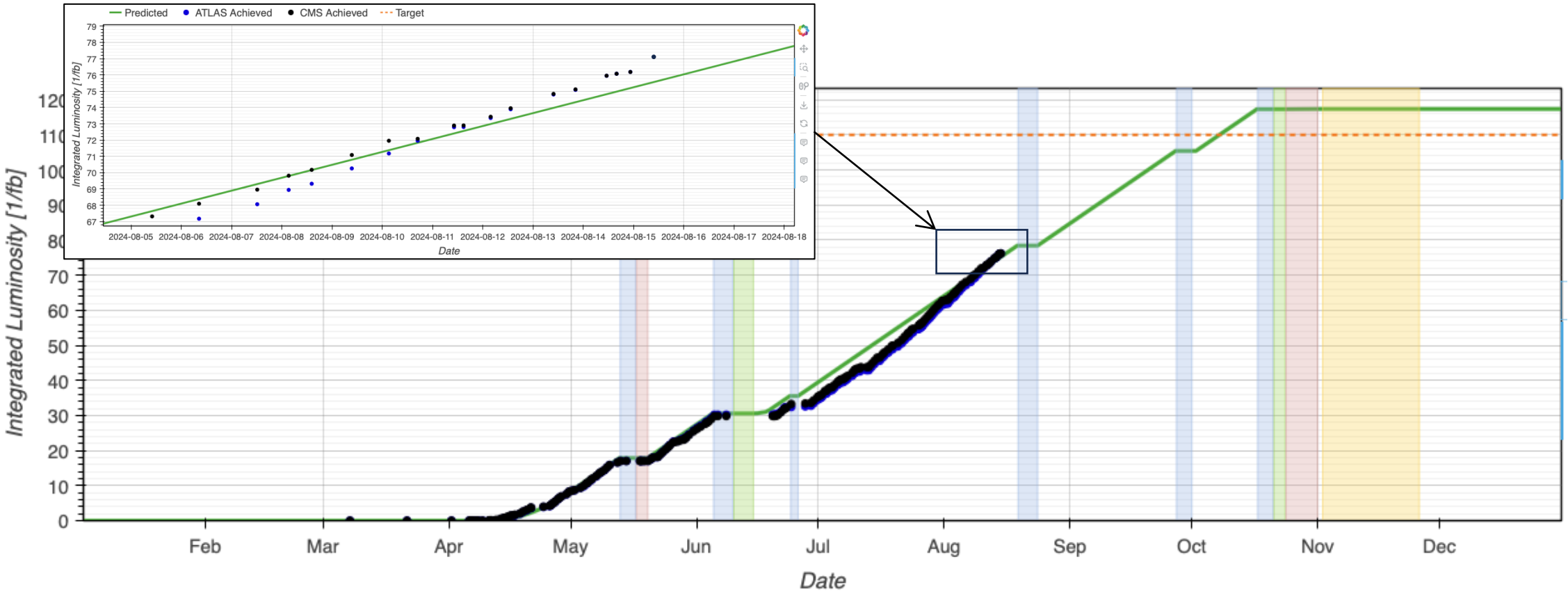
LHC Lumi

- Very good production period in last two weeks with high availability and large fraction in stable beams
  - High injector availability
  - Only one UFO dump ★
  - Still important losses at the beginning of ramp, not clearly correlated with time @450 GeV



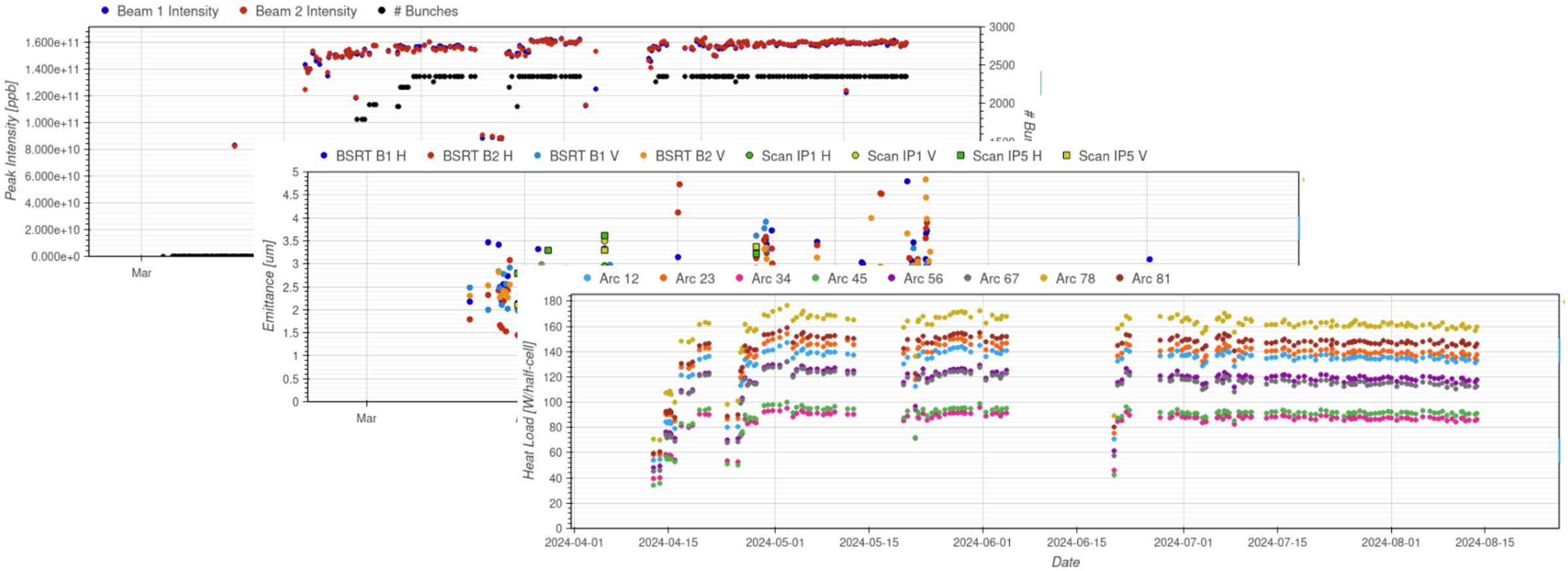
LHC Lumi

- LHC integrated lumi ahead of schedule, which provides good margin



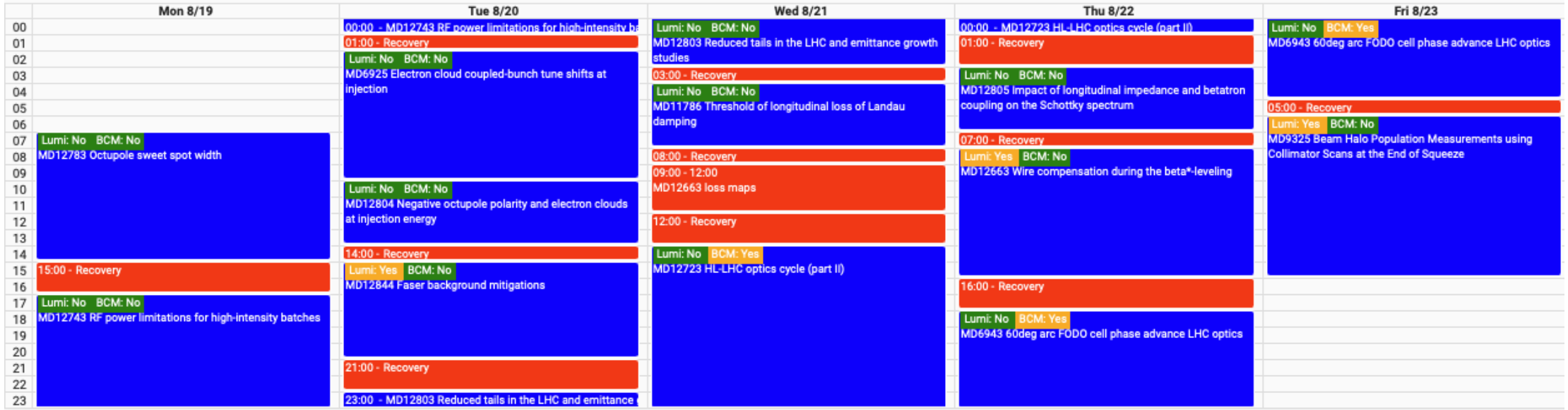
LHC beam parameters

- No important change on beam parameters and heat load



LHC MDs

- [Latest program available on ASM]



MD number	MD title	Required beams
6925	Electron cloud coupled-bunch tune shifts at injection	Bunch trains of 2x48 bunches with intensity 1.2e11 p/b, 1.6e11 p/b, 2.0e11 p/b, 2.3e11. Operatonal 12b train needed as well.
12783	Octupole sweet spot width	INDIV bunches with 1.6e11 p/b, 4x1b per injection hange the transverse emittance by changing the time on the foil. Xavier Buffat knows how perform this manipulation and will be present at the MD.
12804	Negative octupole polarity and electron clouds at injection energy	Bunch trains of 2x48 bunches with intensity, 1.6e11 p/b. (same as MD6925) Operatonal 12b train needed as well.
12805	Impact of longitudinal impedance and betatron coupling on the Schottky spectrum	Single bunches of varied intensity and longitudinal emittance in the range of 0.1-0.3 eVs, 5e9-2.4e11 p/b (taken already in past MD blocks, contacts S. Albright, A. Lasheen)