2022 SPS Pb ion period –

Outcome of the Planning meetings for the last two weeks of the run

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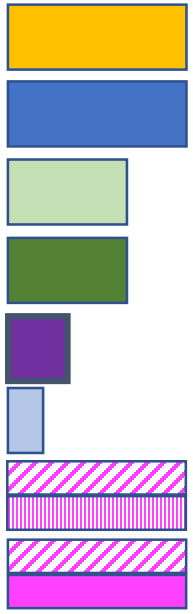
FOM
15.11.2022

Cycle composition proposal for weeks 46 & 47

By Kevin and Reyes

List of cycles to be played next two weeks:



SFTION1 (25.2 s)

LHCMD1 (27.6 s)

LHCION1 (slip-stacking) (14.2 s)

LHCION3 (3 single) (13.2 s)

LHCION1 main cycle and
LHCION3 is the spare

AWAKE (7.2 s)

MD1 (3.6 s)

LHC 12 bunch (24 s)

LHC BCMS (27.6 s)

Pilot main cycle and 12 b or BCMS spare
Cycles needed for LHC filling

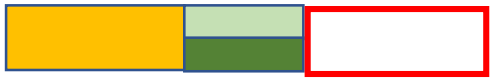
AWAKE cycles Place holder ➔ **Barbara decides what goes here**

Super-cycle Proposal:

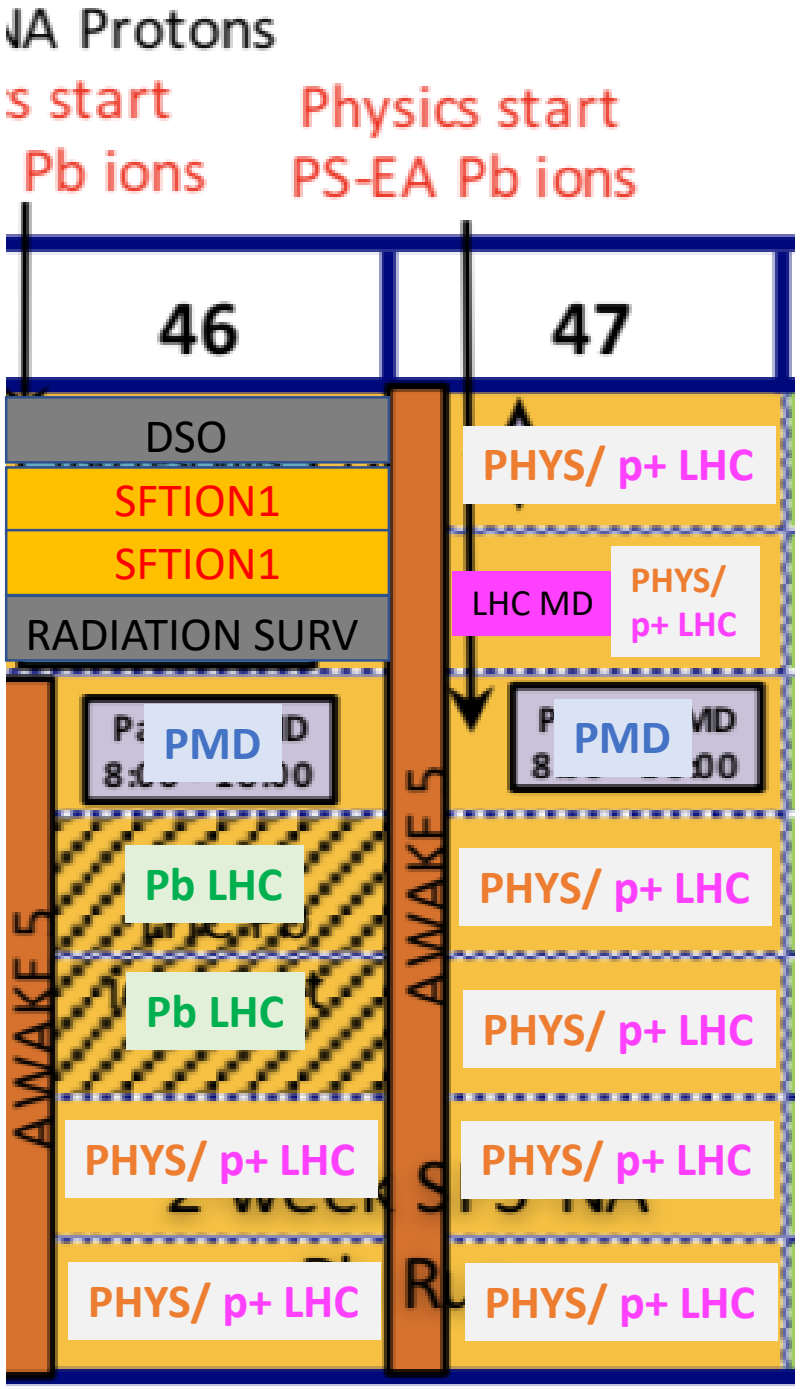
Category **PHYS**: cycle combination for physics production

Category **PMD**: cycle combination for parallel MD day

Category **Pb LHC**: cycle combination for LHC Pb test: 33BP+AWAKE



Category **p+ LHC**: cycle combination for LHC p+ filling



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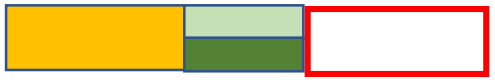
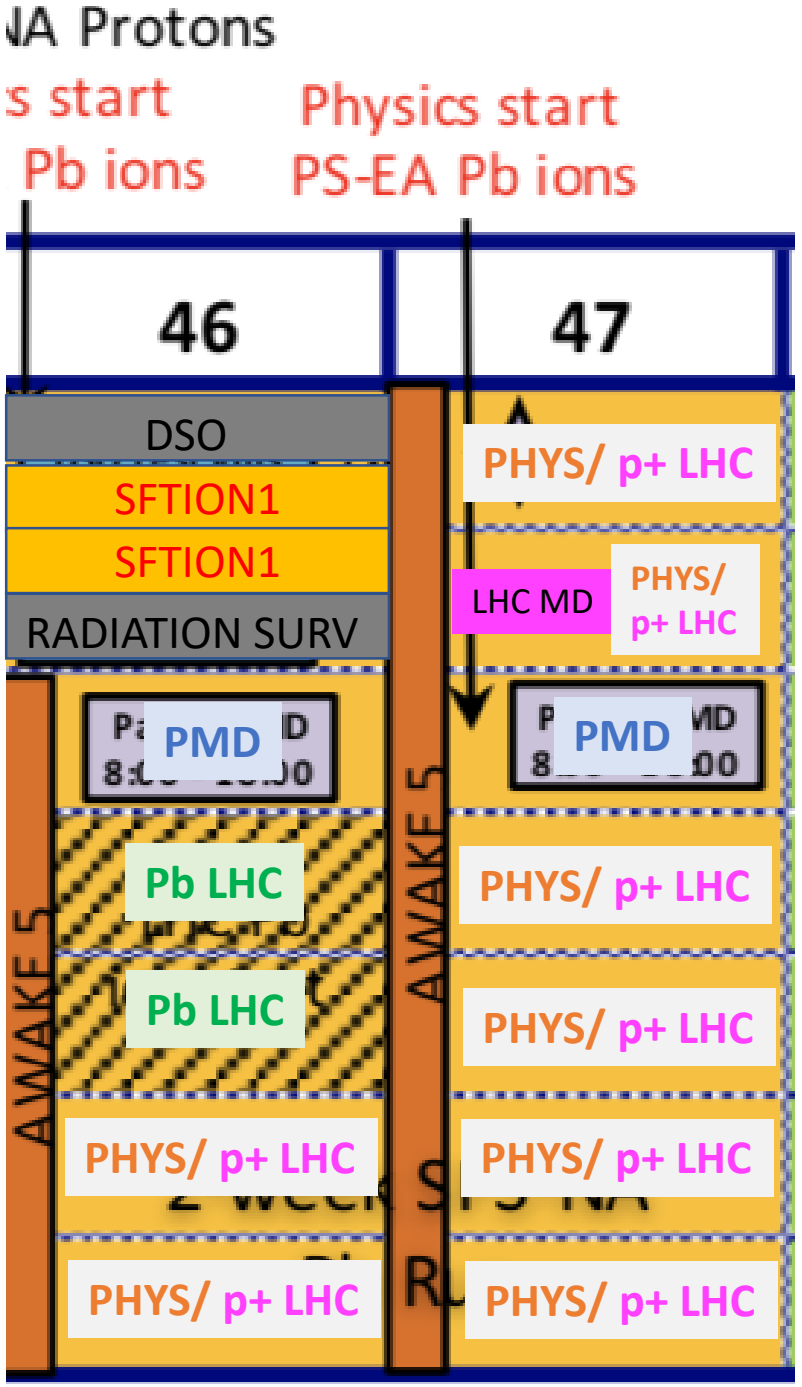


Category **p+ LHC**: cycle combination for LHC p+ filling

To be confirmed:

- **That PMD is not compatible with AWAKE**
- **If AWAKE prefers to be in the same super-cycle with Pb LHC or prefers to have a break during Pb LHC filling**



Supercycle

From Alexander

Super-cycles for the last two weeks of the 2022 run

- **Standard night super-cycle will be two SFTION1 cycles** (better sharing for PS and Booster users)
- **Standard super-cycle when AWAKE and NA FT ions: 1 SFTION1 + 3 AWAKE**
  - AWAKE will run O(10 hours / day): shorter run time due to higher number of cycles in the supercycle – times and durations to be confirmed – 9:00 to 19:00

- Super-cycles see slides from Alex

LHC ion MDs

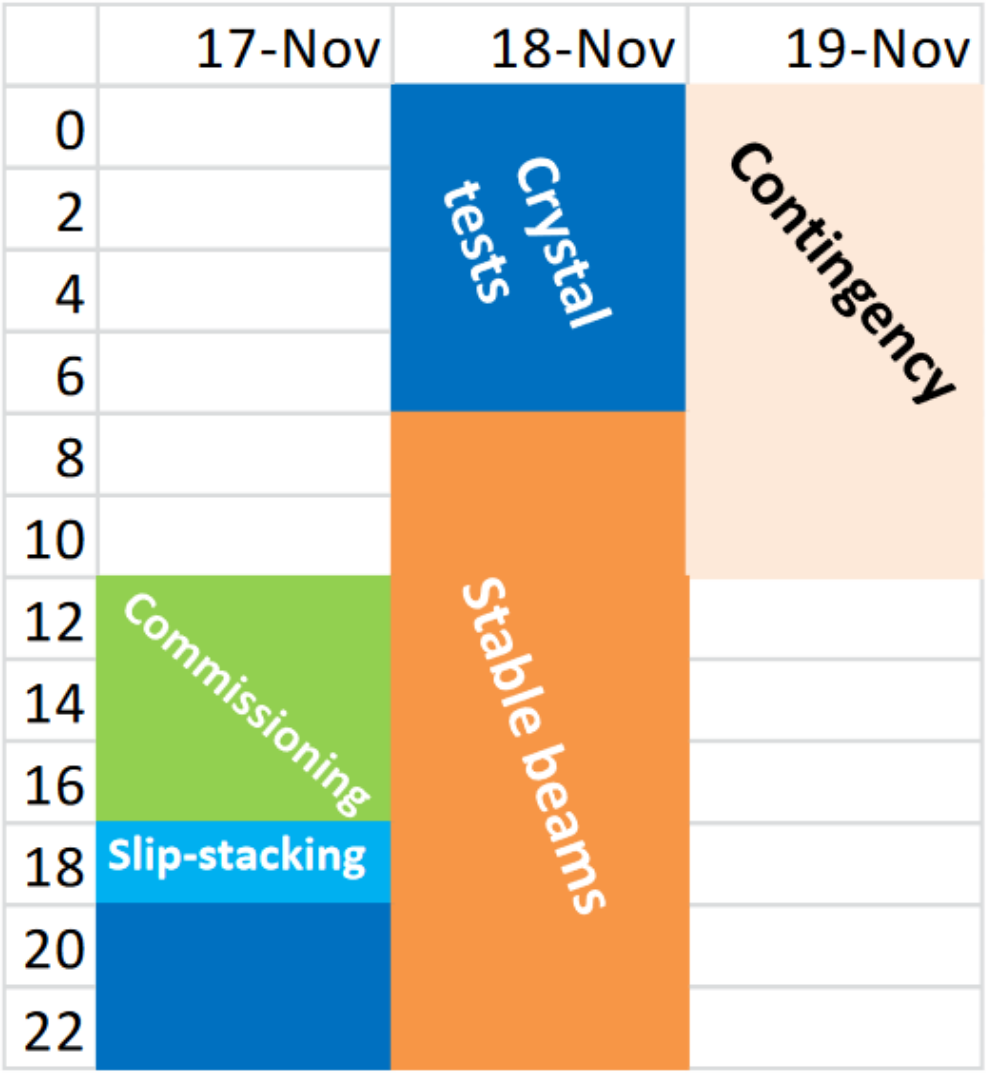
From Roderik

Overview of planning

- Plan (**Total: 36h**)
  - Commissioning → **6h**
  - Slip-stacking tests at injection → **2h**
  - Crystal collimation test → **12h**
  - Stable beams, 2 fills → **16h**
    - Maybe TCLD test as end-of-fill
  - Have 2 days allocated, i.e. we have some contingency in case of unexpected problems, machine downtime etc.

- Advantages of doing things in this order:
  - If beam quality is satisfactory, we can do stable beams with short slip-stacked trains
  - If there are no issues, we can do stable-beam Pb ion operation with crystal collimation (first time ever!)
  - If we start only at noon on Nov. 17, start of stable beams does not end up in the night

Tentative planning – present proposal
(assuming we start at 8am on Nov. 17)



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Period with frequent LHC cycle in the super-cycle: Thursday 12:00 to 22:00
→ no AWAKE during this time (not enough stability for AWAKE

In case of schedule changes → please inform AWAKE and NA61 as soon as possible and put it on page1

Tentative planning – present proposal
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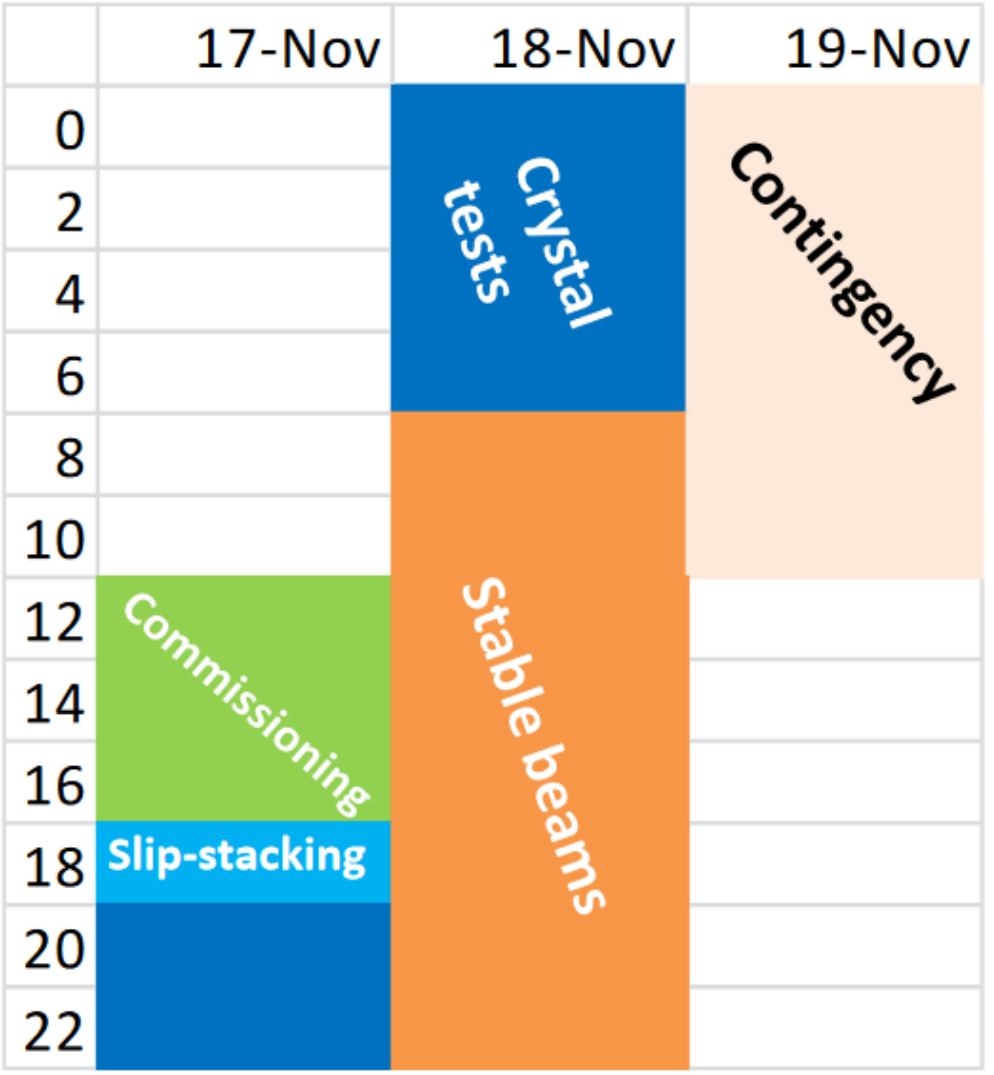


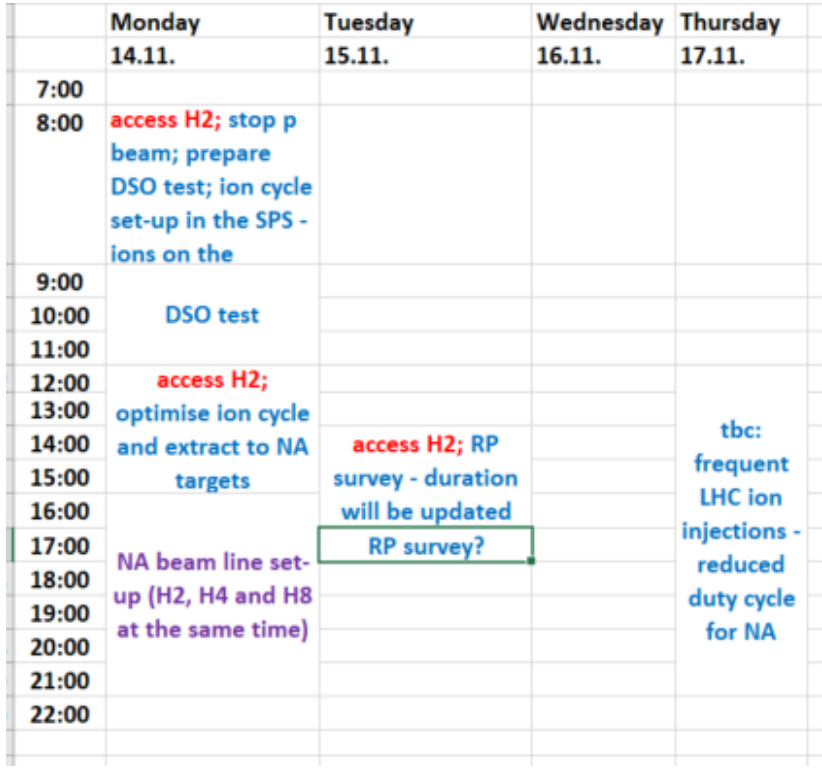
Schedule

Putting it all together

Schedule

- AWAKE 3 cycles / super-cycle during Sunday 13.11. → advance AWAKE a bit to ease the schedule during the ion run
- NA61 – SFTION1 shall always be in the super-cycle (during all MD periods)
- AWAKE
  - Typically 10 hours per day 9:00 – 19:00
  - 3 cycles in super-cycle if no MD
  - Will start at the latest Wednesday 16.11. at 18:00 and can take beam until Thursday 17.11. 12:00
  - Can get beam again from Thursday 17.11. 22:00 until the end of the run – with the exception of Wednesday 23.11. parallel MD

- To be checked:
  - AWAKE can not / does not want to run in parallel to the parallel MDs on Wednesdays?
  - AWAKE run during the LHC ion MD days: super-cycle with LHC-ion + SFTION1 + AWAKE or pause AWAKE when LHC-ion?



	Monday 14.11.	Tuesday 15.11.	Wednesday 16.11.	Thursday 17.11.
7:00				
8:00	access H2; stop p beam; prepare DSO test; ion cycle set-up in the SPS - ions on the			
9:00	DSO test			
10:00				
11:00				
12:00	access H2; optimise ion cycle and extract to NA targets			tbc: frequent LHC ion injections - reduced duty cycle for NA
13:00				
14:00		access H2; RP survey - duration will be updated		
15:00				
16:00				
17:00	NA beam line set-up (H2, H4 and H8 at the same time)	RP survey?		
18:00				
19:00				
20:00				
21:00				
22:00				