HERD 2024 Beam Request

2023-12-14

2024 Injectors Schedule

- **The Research Board decided on 6 December:**
  - The 5.5 weeks of Pb ion running until LS3 to be share over 2024 and 2025 with a Pb ion run at the end of each year.

Experimental facility	Start Physics	End Physics	Duration 2024 [days]* Ver. 0.4a	
ISOLDE	08.04.2024	28.10.2024	**199**	
nTOF	25.03.2024	28.10.2023	**213**	
PS East Area p^+	18.03.2024	28.10.2023	**220**	
PS East Area Pb ions	14.03.2024	28.10.2024	**14**	
SPS North Area p^+	10.04.2024	20.06.2024	**78**	**165**
	24.06.2024	26.09.2024	**87**	
SPS North area Pb ions	30.09.2024	28.10.2024	**28**	
ELENA (AD)	22.04.2024	28.10.2024	**185**	
AWAKE	12.04.2024	30.09.2024	**70**	
HiRadMat	29.04.2024	25.09.2025	**20 (+8 contingency)**	

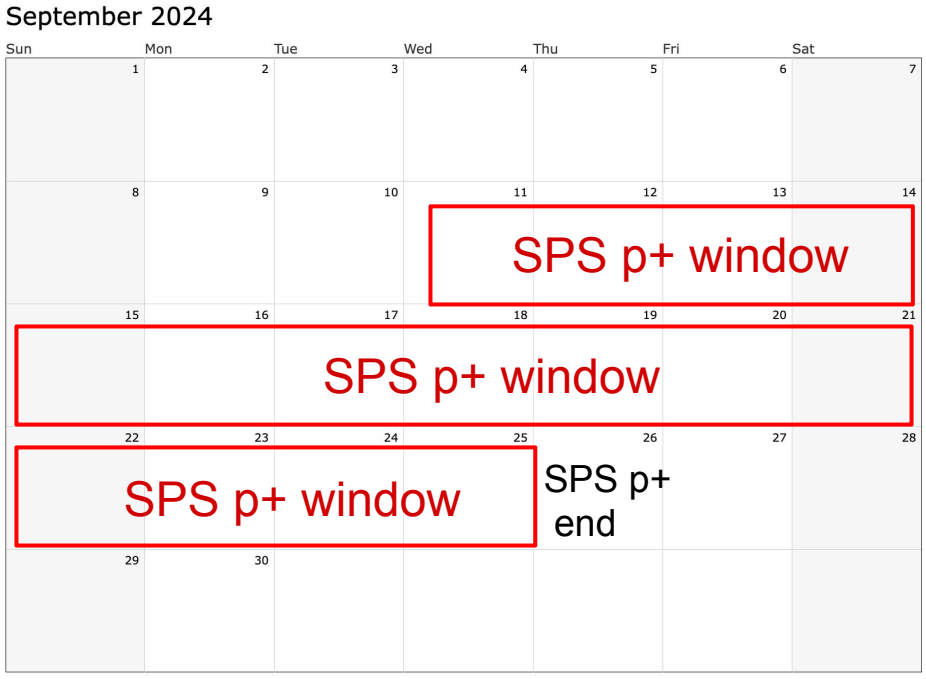
* 4-day TS deducted, but not MD time etc. deducted

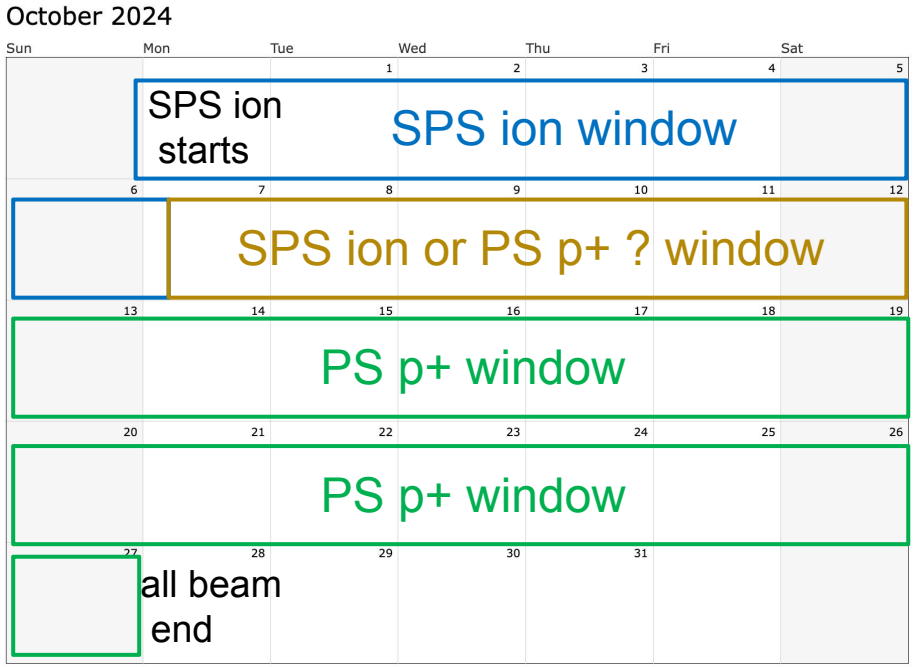
information from several groups

sys.	prototype	beamline and purpose	time constrain	trigger protocol	supporting table
LYSO array	2023 prototype + calibration LED	sps p+, primary p+ for e/p separation	not before September	I2C	using the 2023 table, which stored at CERN
camera	2023 prototype + fully-customized camera	ps, mu/e- to test new camera	not before October		
main trigger	2023 prototype	no special requirement	not before September		
PSD-CN	2023 prototype+ upgrade readout systems	sps/ps charged particle, L0 trigger, uniformity;			
SCD-CN	2023 prototypel+ some new modules	sps ion, chargeZ performance			
STK	one module	sps/ps charged particle, L0 trigger;			
TRD	2023 module; replace working gas and ASIC	ps e- and hardon , TR performance			
PD					
PSD-EU					
SCD-EU					
FIT					

proposal for beam request（baseline）

- beam time
  - not before September
    - start SPS proton at mid-September, 1week, main user
    - move to SPS ion right after, 1week, main user
    - transfer to PS proton, 2 weeks, main user
  - necessity of requesting beam as seondary user?





beam requirements

- sps p+, 1 week
  - primary proton, for CALO e/p separation (strong)
  - H2/H4
- sps ion(Pb), 1 week
  - abundant fragemented ions
  - apply to H8 based on the DAMPE/VLAST experience?
- ps, 2 weeks
  - e-, 0.5 - 5 GeV/c
  - charged hadron ~ 10 GeV/c
  - muons, 5 GeV/c, for new camera calibration if possible
  - T9

proposal for beam request（after TEB）

- SPS proton, in the same beam window, spit into working parameter tuning + physics data taking period, three option proposed with priorities from high to low:
  - option 1: 2 weeks of main user
  - option 2: 1 week of parasitic user + 1 week of main user
  - option 3: 1 week at PS as main user --> transfer to SPS, + 1 week of SPS main user
- Continues SPS proton + ion run
  - the same beam line as top priorities to avoid ‘frequent’ transportation
  - if CERN says ‘same beam line’ requirement can not be guaranteed, we request H8 for ion run for better Z measurement.

open issue

- CALO
  - comprehensively-customized camera will possibly be ready at early October. On-site replacement and test the devices by using electrons at PS, after SPS p+ and ion.
  - requirements of CALO-PD and time constrains, e.g. the first user of SPS ion period for 1 week
  - if new camera not ready, no need to transfer CALO to PS and TRD+other systems participant PS.
- common(compact) structure for PSD/SCD?
  - need decicated meeting. general feeling is not applicable for 2024 (TEB)
- common DAQ?
  - need dedicated meeting. general feeling is not appliable for 2024(TEB)