

HERD 2023 beam requests

2023.01.04

beam requests

PS & SPS Users Beam Requests

Your Existing Beam Requests

You are currently associated with 4 already existing beam requests:

Name (Click for details / editing)	Your Role	Status
test	Editor	Draft
Beam request in SPS Ions 2023 for "HERD"	Editor	Draft
Beam request in SPS Protons 2023 for "HERD"	Editor	Draft
Beam Request in PS Protons 2023 for "HERD"	Editor	Draft

- ▶ CERN online beam requests tool, submission dead line January 7
- ▶ 3 beam requests are proposed, by considering the accelerator(PS/SPS) and primary particle(proton/Pb)
 - ▶ PS protons, SPS protons, SPS Ions

Overview

Overview PS proton, SPS proton & Pb

Name ?	Beam request in Protons 2023 for "HERD"	EDIT				
Period	Protons 2023					
Status	Draft					
Select accelerator(s)	Directly (please choose all requested areas / accelerator complexe(s))	EDIT				
Selected accelerator(s)	<table><thead><tr><th>Short Name</th><th>Name</th></tr></thead><tbody><tr><td>SPS[NA]</td><td>SPS Complex (North Area)</td></tr></tbody></table>	Short Name	Name	SPS[NA]	SPS Complex (North Area)	
Short Name	Name					
SPS[NA]	SPS Complex (North Area)					
Further details concerning the requested accelerator(s)						
Purpose of the Beam Request ?	<p>HERD is a next generation space-born experiment for dark matter search, cosmic ray composition and high energy gamma-ray observations. The novel design in the payload, the working principle and the performances of the detectors will need to be verified by using the test beam, which could also guide the optimization of HERD instruments.</p>	EDIT				

Activity Beam Properties Hardware and Setup Runs and Schedule Safety Funding Submit

Name

PS proton, SPS proton & Pb

EDIT

You can edit the long-form name of the activity here. If you want to change the "short" name of your activity, please get in touch with the PS and SPS physics coordination.

Short Name HERD

Name HERD

Purpose And Description

EDIT

If necessary, please update the purpose of the experiment or test beam activity (e.g. physics, prototype tests, detector or electronics R&D, etc.) and the description of the experimental program, outlining the aim of the test beam program.

Purpose ?

prototype tests

Description ?

a). by using a compact prototype familiar as the payload design, to study the backslash effect, and to verify the corresponding in-orbit trigger logic. b). study of the energy resolution, particle ID, five-side sensitive capabilities, dual readout and fast calibration method of the calorimeter. c).study of the tracking and charge Z measurement of silicon charge detector, fiber tracker and plastic scintillator detector, the Lorenz gamma factor measurement of transition radiation detector.

Category And Committee

Please get in touch with the PS and SPS physics coordination if you require any changes to the categorisation or the responsible scientific committee for this activity.

Category Other activities (CERN external)

Responsible committee n/a

Target Date

EDIT

Please verify and if necessary update the estimated target date (i.e., the envisaged completion date of your experiment or test beam activity, or the preliminary end of the current planning):

Envisaged activity end date ? 2025

Details for the target date ? the mission will be launched around 2026

beam properties

SPS proton, H4/PPE134, H2 PPE172

name	particle type	intensity & beam size (particles/spill, mm)	momentum(GeV/c)
neg. pure e.	electrons(high purity)	1000, 20	20 - 200
primary p	primary proton	1000, 20	400
secondary p	secondary p	1000, 20	350
muon	polarity does not matter	1000, 20	150

SPS Pb, H4/PPE134

name	particle type	intensity & beam size (particles/spill, mm)	momentum(GeV/c)
frag. ion	fragmented ions	1000, 20	150, A/Z=2.2

PS Proton, T9

name	particle type	intensity & beam size (particles/spill, mm)	momentum(GeV/c)
pion	polarity does not matter	1000, 20	5 - 10
neg. pure e.	electrons(high purity)	1000, 20	0.5 - 10

hardware setup

PS proton TBD

Hardware And Setup Configurations

Details for Hardware Configuration **SPS proton & Pb**

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Name of the setup ?	1) Hardware setup for HERD	EDIT
Influence on beam ?	Absorbing (e.g. calorimeter)	
Is your setup a fixed installation?	No	
Overall Description		EDIT
Detector description ?	3-d calorimeter(CALO), Fiber Tracker (FIT), Plastic Scintillation Detection as anti-coincidence (PSD), Silicon Charge Detector (SCD), Transition Radiation Detector(TRD)	

Experimental Area: Dimensions, Weight, Power Requirements **SPS proton & Pb**

Approx. setup length [m] ?	4.0
Approx. setup width [m] ?	2.0
Approx. setup height [m] ?	2.0
Approx. setup footprint [m^2] ?	10.0
Total approx. weight [kg] ?	1000.0
Electrical power [VA] ?	0.0
Details for electrical power ?	None
Crane service required ?	Yes
Approx. setup height [m] ?	2.0
Details for crane service	n/a

runs and schedule (and some keywords)

SPS proton

- exclusion periods(2023/04/05 - 2023/08/30)

name	type of usage	duration(days)	other
muon/2 nd p run	main or parallel	1	calibration firstly
primary p	main or parallel	3	
pure e-	main or parallel	3	

SPS Pb

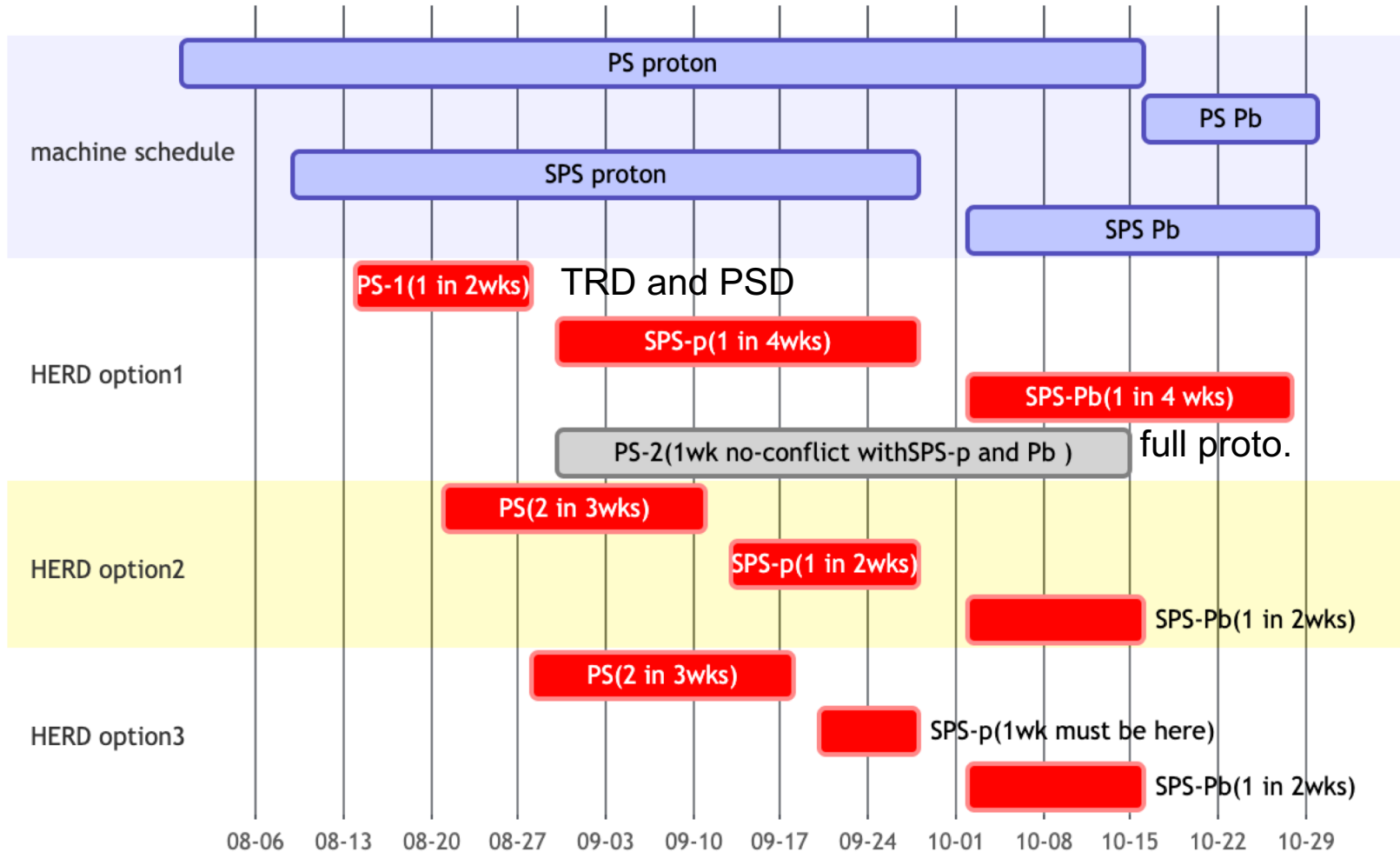
- Pb run as close as possible to proton run(1 out of the first 2wks in Oct.), same user zone as proton run
- **exclusive main user**: other parallel users upstream of us will bring in the heavier beam particle fragmentation issue which shorten the Z range than expected.
- HERD is applying as an CERN recognized experiment, and we hope the ion run period could be extended to 2 weeks if there are any available beam time

name	type of usage	duration(days)
frag. Ion run	exclusive main	7

PS proton? needs to be discussed

name	type of usage	duration(days)	other
pi and e- run	main or parallel	14? 7+7?	

request options regarding to PS runs



trigger validation at PS proton?

Funding

External Funding (EURO-LABS)

Starting with October 2022, the **EURO-LABS project** <https://web.infn.it/EURO-LABS/> (EU Grant Agreement 101057511) aims, among others objectives, to provide efficient access to the available resources at a major fraction of EUROpean Laboratories for Accelerator Based Sciences.

Funding Information

As a participating Laboratory under WP 4.1 and WP 4.4 (PS & SPS, test beams), please indicate to us if you already have or intend to apply for external funding under this initiative for your beam request:

EDIT

Funding application	Will not apply for EURO-LABS Transnational Access (TA) funding
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Safety

- ▶ Negative answer to all relevant information
 - ▶ Flammable Gases, Poisonous Gases, Greenhouse Gases
 - ▶ Mechanical Safety, Vessels under Pressure, Vacuum
 - ▶ Cryogenic Safety
 - ▶ Laser Safety
 - ▶ Irradiated Materials and Radioactive Sources

backup

Slide from R. Steerenberg, who is the head of the operations group within the Beams Department of CERN

2023 physics accounting

Experimental facility	Start Physics	End Physics	Duration 2023 [days]* Ver. 0.6	Duration 2023 [days]* Normal YETS	Ratio [%]
ISOLDE	10.04.2023	30.10.2023	203	231	83
nTOF	10.04.2023	30.10.2023	203	231	83
PS East Area	17.04.2023	30.10.2023	182	210	81
SPS North Area p ⁺	01.05.2023	28.09.2023	150	192	78
ELENA (AD)	11.05.2023	30.10.2023	172	214	80
SPS North area Pb ions	02.10.2023	30.10.2023	28	28	100
PS East area Pb ions	16.10.2023	30.10.2023	14	14	100
AWAKE	01.05.2023	22.10.2022	67	84	80
HiRadMat	29.05.2023	10.09.2023	15 (+13 reserve)	20 (+8 reserve)	75 (163%)

*TS, MD time, etc. not deducted