

Request for Beam Time at the PS & SPS in 2017

Please fill out this form by editing its electronic version (https://espace.cern.ch/PS-SPS-User-Documents/Shared Documents/beam_request_form_2017.docx) on your computer using *Word* or *OpenOffice*, save the file as **EXPERIMENT_NAME-beam_request_2017.docx**, and upload it to the share point: <https://espace.cern.ch/PS-SPS-User-Documents/2017%20Beam%20time%20requests> latest by **November 19th 2016**.

For questions on the beam test infrastructure, the request procedure or other help you might need to fill the request forms, please contact the liaison physicists for the beam lines Johannes Bernhard, Nikolaos Charitonidis, Adrian Fabich, Lau Gatignon & Edda Gschwendtner (sba-physicists@cern.ch) and/or the PS/SPS physics coordinator (sps.coordinator@cern.ch).

For points 2. to 5. further information can be found at the end of this document.

The draft 2017 CERN injector schedule can be found at [Injector Schedule 2017.pdf](#).

Filled in by:

Roberto Guida

Date:

16/11/2016

1. General

Name of the experiment or test beam activity (e.g. NA60, COMPASS, ALICE-PHOS, RD42):

GIF++

Purpose of the experiment or test beam activity (e.g. physics, prototype tests, detector or electronics R&D)
Give a brief description what the experimental program / what the aim of your test beam program will be.

detector R&D (study of muon detectors performance in presence of gamma background for LHC experiments upgrade)

Responsible person (spokesperson)

Name: Martin Jaekel e-mail: Martin.Jaekel@cern.ch
Home Institute: CERN
Address:
Phone: 16 3197 Fax:
other info or comment:

Person responsible during the run (if different of above, usually run coordinator, test beam coordinator)

Name: e-mail:
Home Institute:
Address:
Phone: Fax:
other info or comment:

Contact person at CERN (if different from responsible person)

If the responsible person is usually not at CERN, please give the name of a contact person who is usually resident at CERN, if possible.

Name:	e-mail:
Home Institute:	
Address:	
Phone:	Fax:
other info or comment:	

Requested beam time (e.g. 1 week, 1 month)

total 8 weeks divided in 3 periods (details in the next section)
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Requested beam time at the PS East Hall of more than 14 days per year and at the SPS of more than 7 days per year needs to be recommended and approved by the relevant CERN scientific committee (e.g. SPSC, LHCC and Research Board).

If your request exceeds 14 days per year at the PS or 7 days per year at the SPS:

has your beam request already been submitted/recommended/approved to/by a committee? Please refer to committee minutes, if possible ([SPS Committee](#), [LHC Committee](#)).

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For a beam test that is not related to any CERN experiment/project etc.

Is your test related to an approved experiment or R&D-project of another laboratory in a CERN member/observer/non-member state, or is it an individual test? Is it a CERN recognized experiment, (provide RE number)? What are your requirements in terms of staff support / material support from CERN?

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2. Beam Requirements

2.1 PS (East Hall)

Particle type, momentum, polarity, intensity, beam size etc. (for details see <http://sba.web.cern.ch/sba/BeamsAndAreas/East/East.htm>)

East hall beam characteristics:

- particle type: electrons (lower momenta), muons, hadrons, both polarities.
- intensity: typically $10^3 - 10^4$.

particle type	<input type="checkbox"/> electrons	<input type="checkbox"/> muons	<input type="checkbox"/> hadrons
Polarity	<input type="checkbox"/> positive	<input type="checkbox"/> negative	<input type="checkbox"/> polarity does not matter
momentum:			
intensity:			
Beam size:			
Target (electron rich/hadron rich) :			
Other requirements or comments:			

Preferred beam line

If you would like to use a preferred beam line, please indicate beam line and reason.

	beam line	Momentum (min. - max.) / GeV/c	your comment
<input type="checkbox"/>	T8	primary particles, reserved for EA-Irrad	
<input type="checkbox"/>	T9	0.5 - 15	
<input type="checkbox"/>	T10	0.5 - 7	
<input type="checkbox"/>	T11	0.4 - 3.5, reserved for CLOUD experiment	

Special requests, other requirements or comments (AIDA telescope, Cerenkov detectors,...):

2.2 SPS (North Area)

Particle type, momentum, polarity, intensity, beam size etc. (for details see <http://sba.web.cern.ch/sba/Documentations/How2controlNAbeams.htm>)

North area beam characteristics:

- particle type: electrons (lower momenta), muons, hadrons, both polarities.
- momentum and intensity: 20 – 250 GeV/c, typically 10^4 particles per spill (π^+).

particle type	<input type="checkbox"/> electrons, purity	<input checked="" type="checkbox"/> muons	<input type="checkbox"/> hadrons
Polarity	<input type="checkbox"/> positive	<input type="checkbox"/> negative	<input type="checkbox"/> polarity does not matter
momentum: 100 GeV/c			
intensity: 10^4 muons/spill			
beam size:			
other requirements or comments:			

Preferred beam line If you would like to use a preferred beam line, please indicate beam line and reason. **In addition, indicate if you need lower or higher momenta (20 GeV/c or below and higher than 250 GeV/c), higher intensities or primary protons/ions!**

	beam line	your comment
<input type="checkbox"/>	H2	
<input checked="" type="checkbox"/>	H4	GIF++ facility
<input type="checkbox"/>	H6	
<input type="checkbox"/>	H8	
<input type="checkbox"/>	M2	
<input type="checkbox"/>	K12	

Special requests, other requirements or comments(AIDA telescope, Cerenkov detectors,...):

3. Time constraints

Preferred and/or excluded time of the year (e.g. early July/August, NOT in July, NOT before June)

1st period: May 15 to May 31
 2nd period: July 20 to August 8
 3rd period: October 5 to October 22

Which problems you will face if we have to reschedule your beamtime request to the 2018 run. (e.g. We will not be allowed to install our detector in, we will not be able to launch production of ...)

GIF++ is a common facility for testing muon detectors for the LHC experiments upgrades. The preferred periods have been discussed and elaborated in collaboration with the GIF++ users community (about 100 persons). Constrains are coming from the simultaneous presence of more than 10 setups (each one with several detectors) under test inside the facility for each period.

In particular the first and the last periods (May 15-31 and October 5-22) are considered very important by all the detector community. They are needed to check the detector performance after a long period of irradiation without beam and before the winter 2017.

4. Equipment and installation

4.1 Type, size and weight of detector (e.g. Silicon detector, RPCs, calorimeters)

Type: muon particle detectors from LHC experiments - several technologies (CSC, DT, GEM, resistive GEM, Glass RPC, MM, bakelite RPC, sTGC)

Size: about m3 each

Weight:

Additional comments: in total more than 10 setups simultaneously under test

4.2 Space and electrical power requirements (e.g. length along beam line, width, power consumption)

Required floor space in exptl. area:

Beam height above floor:

Max. cable length:

Space in control room:

Power requirements:

Cooling required:

Additional comments: GIF++ is already equipped. No additional requirements with respect 2016

4.3 Additional installations (e.g. Magnets, Platforms, Cerenkovs for particle ID)

Magnet:

Cryogenics:

Platforms:

Beam instrumentation:

Additional requirements / comments: The installation/movement of the setups is organized internally

4.4 Time needed for installation/de-installation

Installation:

De-installation:

Additional comments:

5. Safety Hazards

5.1 Flammable / poisonous gases (e.g. Ar/CH4 90/10)

Please check CERN safety rules [PH FGSO Guidelines](#) and contact the [PH-FGSO](#) (PH division Flammable Gas Safety Officer) if you want to use flammable mixtures or if in doubt.

iC4H10 (nC5H12 to be confirmed)

5.2 Pressure / vacuum / cryogenics (e.g. gas detectors under pressure, LAr detectors)

Such equipment might need additional technical safety inspections or tests. Please check CERN safety rules and contact the [HSE Unit](#).

only 1 setup is working at about 2 bara (ATLAS-MDT)

5.3 Laser (e.g. UV-lasers for calibration purposes, N2-, Nd:YAG-lasers)

Please check CERN safety rules and contact the [HSE Unit](#) if you want to use a laser other than a laser pointer.

5.4 Irradiated materials and sources (e.g. detectors or any materials that have been irradiated)

Please check CERN safety rules and contact the [HSE RP Group](#) if you intend to make an irradiation of material or want to use any irradiated and activated materials.

6. Additional comments from your side

More comments / questions: more than 10 different setups with real size detectors are constantly under test at GIF++. During beam time it is impossible to have all the setups on the beam line. Indeed we prepare a schedule which is optimizing irradiation space and beam time. More than one period per setup is needed in order to study detector performance versus accumulated dose.

After your beam request has been submitted, you may be asked by the SPS/PS Coordinator to supply more information if necessary.

Additional explanations to points 2. – 5.

2. Beam Requirements

Particle type, momentum, polarity, intensity, beam size (e.g. muons, electrons, hadrons, 10^4 particles per spill) and **Preferred beam line** (e.g. T9, T10, T11 at the PS or H2, H4, H6, H8 at the SPS)

Information on the characteristics of the various beam lines can be found on the web

(<http://sba.web.cern.ch/sba/>). Some beam lines are more suited to certain particle types and energies than others, e.g. the H4 beam is the best beam line for high energy electrons (up to about 300 GeV/c). If you would like to use a preferred beam line, please indicate.

A variety of particle types, intensities and particle densities from secondary or tertiary beams is available. As neighbored beam lines might share secondary beams from the same target, there are correlations between those beam lines. At the PS East Hall, T9/T10/T11 are using the same (North) target. At the SPS, H2/H4 and H6/H8/NA62 are making use of beams from the same target, respectively. Only users whose beam requirements are compatible are able to run in parallel in those beam lines. Thus, please give as much information as possible here, e.g. if you need hadrons (pions) or electron enriched beam. Please also specify if you need a particular polarity (e.g. negative pions only) or if the polarity doesn't matter. The choice of polarity can have a big impact on the scheduling.

3. Time constraints

Preferred and/or excluded time of the year (e.g. early, late, July/August, NOT in July, NOT before June)

Please indicate the preferred running period. Please also give your excluded running periods if any, e.g. NOT in July due to conferences or NOT before June because your detector might not be ready. This information helps a lot to solve conflicts if the schedule becomes tight.

4. Equipment and installation

4.1 Type, size and weight of detector etc. (e.g. Silicon detector, RPCs, calorimeters)

Please indicate (if possible), amount of radiation/interaction length. If you have a "transparent" detector (e.g. tracking detector), other parasitic users further downstream may be able to use the beam as well. This usually is more difficult if your detector is a calorimeter where only muons get through.

4.2 Space and electrical power requirements (e.g. length along beam line, width, power consumption)

Space along the beam line could be limited by additional Cerenkovs, mobile beam instrumentation or magnets that you might not find on drawings. If your electronics has large power consumption, please indicate the approximate power needed (kW).

4.3 Additional installations (e.g. Magnets, Platforms, Cerenkovs for particle ID)

If you need additional installations, e.g. magnets etc. please bare in mind that they need cooling water, cables and power supplies. Although a magnet apparently looks installed in a beam area, it might not be operational as e.g. cables or power supplies might be in use elsewhere. A limited number of Cerenkov detectors for particle ID are available. Please indicate early enough if you intend to use them.

4.4 Time needed for installation/de-installation

*The allocated time period includes the time needed for installation/de-installation. It is assumed that you remove your equipment completely from the beam area and the electronic huts **before** your time period has been finished and the hand-over to the next user takes place. Please contact the SPS/PS Coordinator if you want to keep equipment in the beam area after your time period is finished.*

5. Safety Hazards

Because of its international status and because some of its activities are unique in Europe, CERN has its own specific safety regulations. Please make yourself familiar with the safety regulations at CERN, [HSE Unit Web pages](#).

Be aware that there exists an obligatory form on **Initial safety information on experiments at CERN ISIEC Web form**. The form needs to be filled by all new experiments, new test beam users or in case of major modifications of existing equipment and sent to the PH Division Safety Officer DSO & PS/SPS coordinator: <mailto:DSO-PH@cern.ch>, Sps.Coordinator@cern.ch. For experiments that are scheduled for a period more than 3 weeks, safety information will be requested in the "Safety File" framework.

5.1 Flammable / poisonous gases (e.g. Ar/CH4 90/10)

If you need to use any gases, please indicate the gases and give their mixture even if you believe that the mixture is non-flammable. CERN rules on flammability are in general stricter and gases might be considered flammable at CERN but non-flammable elsewhere. Please consult the [PH FGSO web pages](#) and contact the PH-FGSO (PH division Flammable Gas Safety Officer) if you want to use flammable mixtures or if in doubt.

5.2 Pressure / vacuum / cryogenics (e.g. gas detectors under pressure, LAr detectors)

Such equipment might need additional technical safety inspections or tests, please contact <mailto:safety.info@cern.ch>.

5.3 Laser (e.g. UV-lasers for calibration purposes, N2-, Nd:YAG-lasers)

Any lasers and in particular UV-lasers require special protection measures depending on their energy or power. These could be protecting tubes or special glasses for people working with them. Please contact the [PH Laser Safety Officer \(LSO\)](#) if you want to use a laser other than a laser pointer, and fill the ISI form (https://edms.cern.ch/document/816962/LAST_RELEASED).

5.4 Irradiated materials and sources (e.g. detectors or any materials that have been irradiated)

If you intend to make an irradiation of material, first check the URLs below and contact the relevant facility coordinators:

<https://ps-irrad.web.cern.ch> for proton irradiations at the PS East Area IRRAD facility

www.cern.ch/charm for mixed-field irradiations at the PS East Area CHARM facility

www.cern.ch/gif-irrad for gamma irradiations at the SPS North Area GIF facility

In general, irradiations of material with hadrons produce residual radioactivity. Depending on the expected activation levels, an irradiation permit (Radiation Protection Procedure - PRP 17) and/or a detailed work and dose planning might be required to avoid unnecessary high personal doses (see above URLs for details). To handle/use any irradiated and activated materials, the Radiation Protection group DGS-RP (<https://espace.cern.ch/hse-unit/en/hse-rp/Pages/default.aspx>) should be contacted well in advance. Use of strong sources or radioactive gases, e.g. Kr83 for calibration purposes also might require additional safety measures.