Request for Beam Time at the PS/SPS in 2006

Please fill out this form by editing its electronic version (http://spsschedule.web.cern.ch/SPSschedule/beam_request_2006.doc) on your computer using *Word* or *OpenOffice*, and send it to the PS/SPS physics coordinator Christoph Rembser (sps.coordinator@cern.ch) latest by Friday October 28 2005.

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 Ilias Efthymiopoulos (Ilias.Efthymiopoulos@cern.ch) and Lau Gatignon (Lau.Gatignon@cern.ch) 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 2006 CERN accelerator schedule can be found at
http://ab-div.web.cern.ch/ab-div/Schedules/Schedules.html
or at http://psschedule.web.cern.ch/PSschedule/ / http://spsschedule.web.cern.ch/SPSschedule/

Filled in by:	**Date:**
Felix Sefkow	28.10.2005

1. General

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

CALICE (Calorimetry for a Linear Collider Experiment)

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: test new technologies: highly compact and granular silicon tungsten electromagnetic calorimeter and highly granular gaseous or scintillator based hadron calorimeters
Physics: test hadron shower simulation models with regard to features relevant to "imaging calorimetry", develop topological shower reconstruction algorithms
The physics goals require the accumulation of fairly large data samples;
we estimate a total of 10**8 events.

Responsible person (usually run coordinator, test beam coordinator, spokesperson)

Name: Jean-Claude Brient e-mail: brient@poly.in2p3.fr
Home Institute: Ecole Polytechnique
Address: Palaiseau, France
Phone: +33 (1) 6933 3146 Fax:
other info or comment: Spokesman;
Testbeam contacts: Paul Dauncey, Imperial College, London, UK, p.dauncey@ic.ac.uk, +44 (20) 7594 7803
Felix Sefkow, DESY, Hamburg, Germany, felix.sefkow@desy.de, +49 (40) 8998 3402

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: Tiziano Camporesi e-mail: tizianao.camporesi@cern.ch
Home Institute: CERN

Address: CERN Phone: +41 22 76 72677 Fax: other info or comment:

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

2 periods of 4 weeks each, in addition 2 weeks of parasitic running for commissioning with muons (low flux, e.g. behind dump, ideally with free access).

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 (http://committees.web.cern.ch/Committees/SPSC/WelcomeSPSC.html).

Submission is intended for the November SPSC meeting.

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? What are your requirements in terms of staff support / material support from CERN?

The R&D programme of the CALICE collaboration is reviewed and approved by several committees in member and non-member states, for example the DESY Physics Research Committee which has an independent and international composition. We are asking from CERN the provision of network access, electrical power, gas supply for the beam instrumentation devices (DWC, Cerenkovs), technical support to move and install the detectors and some expertise support to operate the beam line. We need a temporary counting romm and some office space.

2. Beam Requirements

2.1 PS (East Hall)

Particle type, momentum, polarity, intensity, beam size etc. (for details see http://ab-div-atb-ea.web.cern.ch → Experiments & users)

East hall beam characteristics:
- particle type: electrons (lower momenta), muons, hadrons, both polarities
- intensity: typically 10^3 – 10^4

particle type	☐ electrons	☐ muons	☐ hadrons
Polarity	☐ positive	☐ negative	☐ polarity does not matter
momentum:			
intensity:			
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.

	beam line	Momentum (min. - max.) / GeV/c	your comment
☐	T7	1 – 10 / primary particles	
☐	T8	primary particles	
☐	T9	1 - 15	
☐	T10	1 - 7	
☐	T11	1 - 3.5	

Special requests, other requirements or comments:

2.2 SPS (North Area)

Particle type, momentum, polarity, intensity, beam size etc.
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	☒ electrons	☒ muons	☒ hadrons
Polarity	☐ positive	☐ negative	☒ polarity does not matter
momentum: 2-100 GeV			
intensity: 2000 particles / spill			
beam size: 1 cm, for muon s 20cm			
other requirements or comments: We would like to run with low energy tertiary beam for one of the two periods, preferentially for the second. A one day test of the ECAL module alone with higherst possible electron energy is requested in addition. Antiprotons would be valuable, if sufficient rates can be obtained with reasonable effort.			

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!

	beam line	your comment
☒	H2	H2 or H8 are preferred for HCAL and combined runs because of the availability of low energy tertiary beams
☒	H4	H4 would be ideal for the ECAL standalone tests (first run period)
☒	H6	H6 would fulfill our basic needs
☒	H8	H2 or H8 are preferred for HCAL and combined runsbecause of the availability of low energy tertiary beams
☐	M2	
☐	K12	
☐	P41/61	

Special requests, other requirements or comments:

3. Time constraints

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

We prefer the second period to be scheduled as late as possible, and a period of at least 4 weeks between the 2 two beam runs. The ECAL will be ready in June, the HCAL and TC in July.

4. Equipment and installation

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

Type: ECAL / HCAL / Tail Catcher
Size: 0.4 / 1m / 1.2 m
Weight: 0.5t / 6t / 10t
Additional comments: Tail Catcher always together with HCAL. "Combined" refers to all three. Dimensions do not include the movable table.

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

Required floor space in exptl. area: 6m width * 5m depth
Beam height above floor: >1.6m
Max. cable length: 10m
Space in control room: 6 work stations
Power requirements: ~5 kW
Cooling required: -
Additional comments:

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

Magnet: -
Cryogenics: -
Platforms: -
Beam instrumentation: Delay wire chambers, 2 Cerenkov counters
Additional requirements / comments:

4.4 Time needed for installation/de-installation

Installation: 1 day for the ECAL, 10 work days for the first HCAL installation, can be faster if required, less for re-installations after breaks.
De-installation: 5 work days maximum
Additional comments: Installation times are given for the present design. Modifications (e.g. to allow movement of the complete HCAL set-up by crane) can be carried out if this turns out to be critical for our program. - We estimate 4 days for electronics tests and debugging after installation.

5. Safety Hazards

5.1 Flammable / poisonous gases (e.g. Ar/CH4 90/10)
Please check CERN safety rules and contact the PH-FGSO (PH division Flammable Gas Safety Officer http://safety-commission.web.cern.ch → Safety Committees → FGSOC) if you want to use flammable mixtures or if in doubt.

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5.2 Pressure / vacuum / cryogenics (e.g. gas detectors under pressure, LAr detectors)
Such equipment might need additional technical safety inspections or tests.

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5.3 Laser (e.g. UV-lasers for calibration purposes, N2-, Nd:YAG-lasers)
Please check CERN safety rules and contact the TIS-RP group (radio protection group http://safety-commission.web.cern.ch → Radiation Protection) if you want to use a laser other than a laser pointer.

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5.4 Irradiated materials and sources (e.g. detectors or any materials that have been irradiated)
Please check CERN safety rules and contact the TIS-RP group (radio protection group http://safety-commission.web.cern.ch → Radiation Protection) if you intend to make an irradiation of material or want to use any irradiated and activated materials.

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6. Additional comments from your side

More comments / questions:

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. T7, T8, 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://ab-div-atb-ea.web.cern.ch → Experiments & users). 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 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, http://safety-commission.web.cern.ch.

*Be aware that there exists an obligatory form on **Initial safety information on experiments at CERN** (https://edms.cern.ch/file/383772/LAST_RELEASED/ISIEC.pdf). 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 (http://ph-dep.web.cern.ch/ph-dep/Safety/SafetyOfficers.html)*

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 more strict and gases might be considered flammable at CERN but non-flammable elsewhere. Please contact the PH-FGSO (PH division Flammable Gas Safety Officer http://safety-commission.web.cern.ch → Safety Committees → FGSOC) 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.

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 TIS-RP group (radio protection group http://safety-commission.web.cern.ch → Radiation Protection) 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)
*If you intend to make an irradiation of material or want to use any irradiated and activated materials, the TIS-RP group (radio protection group http://safety-commission.web.cern.ch → Radiation Protection) should be contacted well in advance. Irradiation of materials in general requires an **irradiation permit** (Radiation Protection Procedure PRP 17, form available from TIS-RP or as EDMS document ID 338324 https://edms.cern.ch/document/338324/2.1). Depending on the expected activation, a detailed work and dose planning might be required to avoid unnecessary high personal doses. Use of strong sources or radioactive gases, e.g. Kr^{83} for calibration purposes also might require additional safety measures.*