Aug. 1st. 2005

Call for Letter of Intent
for
Muon Science Experiments
at
the Muon Facility in the Materials and Life Science Facility at J-PARC

The JAERI-KEK Joint Project on High Intensity Proton Accelerators (J-PARC) is now in the 5th year of the construction period. The civil engineering including that for the Materials and Life Science Facility (MLF) building is currently in progress. According to the current construction schedule, it is expected that, if the proposed budget is funded smoothly, the first beam from this facility will be available in 2008. The muon construction team is now experiencing extremely busy period to complete design and development work for the primary proton beamline components to be installed to the Muon Facility in the MLF building. Although it is still three years before the scheduled first beam, the Project Team would like to call for the Letters of Intent, based on the recommendation of the Muon Science Advisory Committee (MuSAC), on the muon experiments *requiring major instrumental installation* at the MLF-Muon Facility. Applications from all over the world are welcome.

Scope of the J-PARC Muon Project

The "Phase 1" (approved portion) of the accelerator complex in this project consists of a linac (200 MeV in 2008 and 400 MeV at a later stage) followed by a 3 GeV PS and a 50 GeV PS. The 3 GeV proton beam will be delivered to both muon and neutron production targets in a successive manner so that both muon and neutron beams are available at the same time. The Phase 1 budget includes components associated with the primary proton beamline and not the secondary beamlines. The MuSAC suggested the re-usage of available components currently used at KEK-MSL (superconducting solenoid, channel magnets, shielding blocks, etc.) after refurbishment, so that at least one secondary muon beamline is available at the first proton beam delivery. In subsequent years, the budget request for the completion of the secondary muon beamlines (Phase 2) is planned. Details of the entire floor plan are shown in Attachment 1.

Purpose of LoI

We would like to call for LoI's at this time for the following purposes.

1. The current budget covers the completion of primary proton beamline and one muon production target. It does not cover the construction of secondary muon beam lines nor infrastructures necessary for experiments (spectrometers, sample environments, etc.). Although the entire Muon Facility consists of a muon production target and four muon extraction channels, the current budget covers the target and a limited part of the channel magnets. In order to make the Day-1 muon experiment possible, the KEK-MSL group plans to ship the superconducting solenoid channel that is currently used at the KEK-MSL with an appropriate refurbishment. The present plan created in this way is shown in Attachment 1 of this document. Although the project team is making an initial design of the beam channels, the final design of these beam channels must be made to satisfy actual experiments at this facility. Initiating the evaluation of anticipated experiments is the prime purpose of this call for LoI's.
2. The present plan in the Phase 2 program is to install the secondary muon beamlines, where 4 surface muon channels, 2 decay muon channels, and 1 slow muon channel are planned. Budget for Phase 2 does not include the Instrument to be installed at experimental port. Considering this situation, the MuSAC recommended to seek the possibility for users to bring their own beamline and/or equipment(s), called the "Core Users Program". The Core Users, who bring their own beamline and/or equipment(s), will be allowed to "occupy" the beamline for a significant fraction of beam time, although the details of the rule are still under discussion. Those who are interested in having such a beamline and/or equipment(s) are encouraged to submit the LoI's to describe their plan. Upon receipt of all LoI's of experiments and beamlines at the Muon Facility, the MuSAC will discuss how the proposed installation can be reconciled/optimized with the current Phase 2 program.
3. At this point, we also anticipate receiving new ideas and new proposals for those experiments that require immediate action(s) related to the design of the secondary muon production target and associated beamlines. We call these programs the Phase 3/4 projects of the facility. Although we cannot foresee any budget for these experiments at this moment, it is useful and important to learn about their scientific merits. The most important point for these proposals is to identify the place(s) where we must make arrangement immediately during the Phase 1 construction period.

Needed information in LoI

The length of the LoI need not be long, the document must be written in English. Also, the following items must be included in the document.

1. General: Name of the proposal, collaborating institutions and names of members, spokesperson(s) if already known and/or contact person.
2. Scientific goal(s) and merits of proposal, summary on the specification of proposed beamline and/or experimental equipment(s), urgency, expected manpower situation, etc. A draft drawing of the important hardware must be attached.
3. Request of beamline and leg if applicable, specification of experimental equipment, desired changes and extension of the muon facility.
4. Requested beam intensity and beam properties.
5. Estimated cost for the hardware installation, beam line changes and later operation cost for running experiment.
6. Yearly plan for the installation of hardware, tests and experimental running
7. Plan for obtaining funding within the collaboration.
8. Request for the fraction of occupation (β percent) and for the period of occupation for the beam exit (α years)

Other information

1. Deadline: December 31, 2005
2. LoI must be sent to:

   Professor S. Nagamiya
   Director, Project Office of High Intensity Proton Accelerators,
   KEK, 1-1 Oho
   Tsukuba-shi, Ibaraki-ken, 305-0801, Japan
3. Consultation and/or information on LoI:

   Professor K. Nishiyama
   KEK, 1-1 Oho
   Tsukuba-shi, , Ibaraki-ken, 305-0801, Japan
   E-mail: kusuo.nishiyama@kek.jp
   Fax: +81 298 64 5623
4. Process after receiving LoI's

   The Muon Science Advisory Committee will evaluate LoI's and other issues related to Muon Facility of the Materials and Life Science Facility. Based on the recommendations by the MuSAC, the response to each LoI will be made by April, 2006.

Attachment

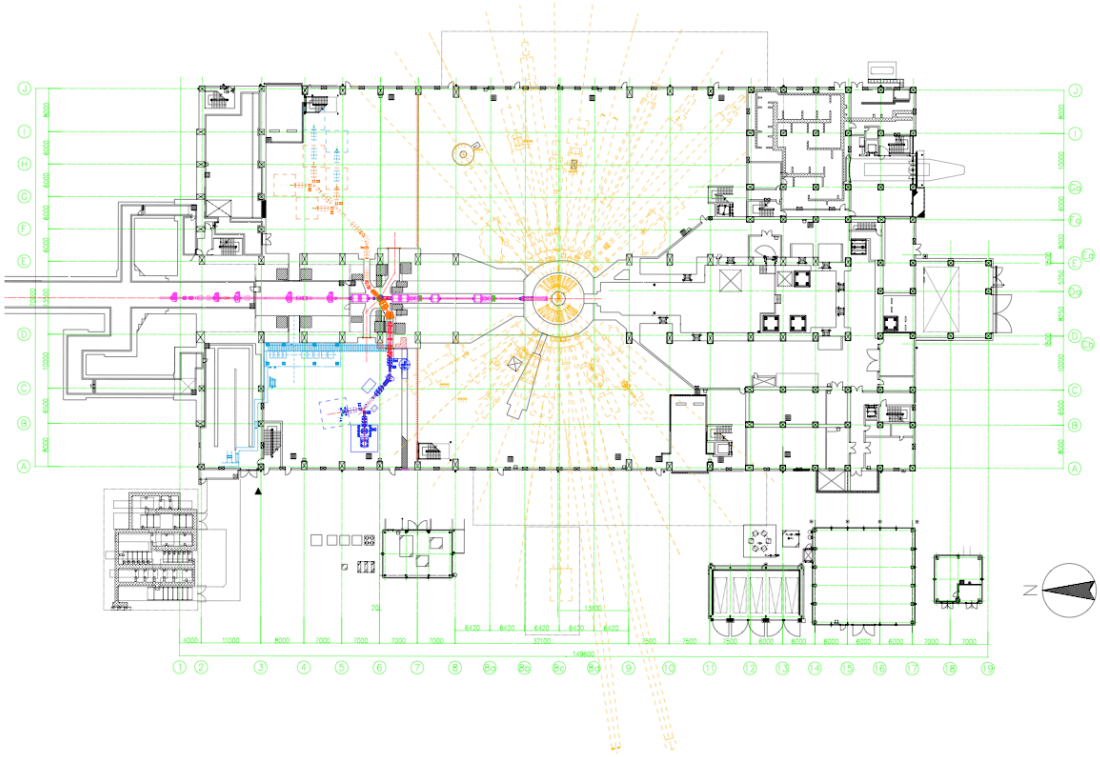

Fig. 1 layout of MLF building

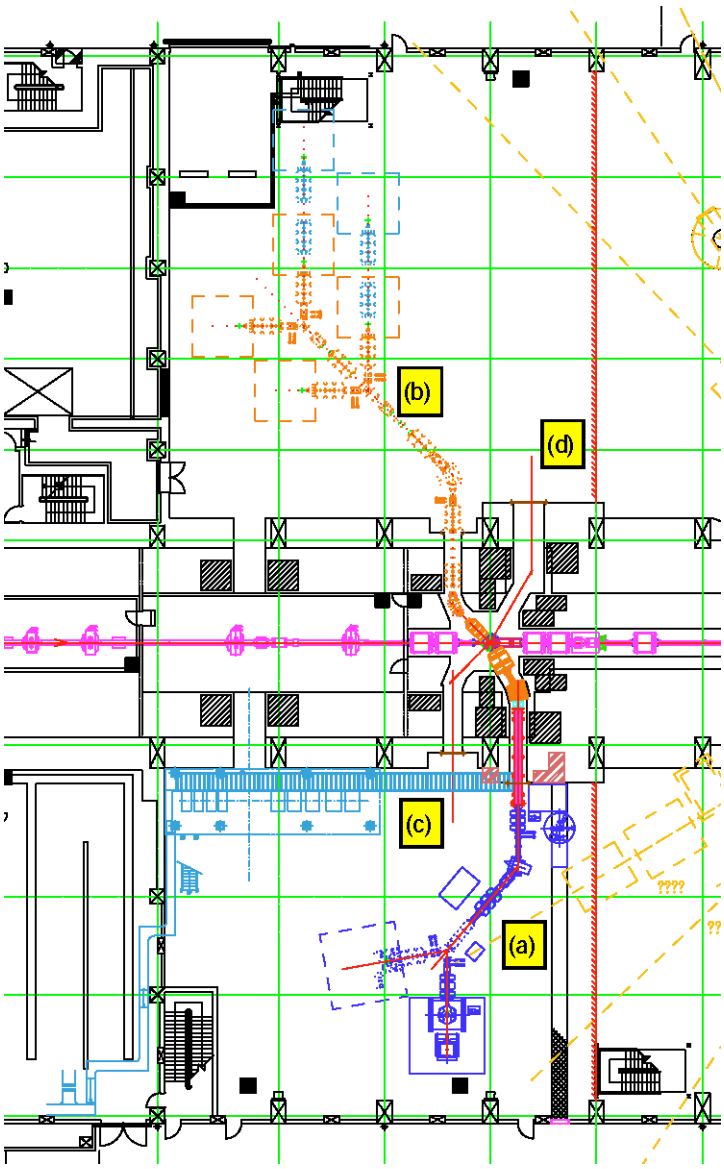

Fig2. Arrangement of the present plan.

Superconducting solenoid (red) and secondary beam channel magnets (blue) will be transported from KEK-MSL

(a) Superconducting Solenoid channel for general purpose
(b) Surface muon channels
(c) Slow muon channel
(d) Decay muon channel