J-PARC Muon Science Facility and its physics to be extended

Y. Miyake[a], N. Kawamura[a], P. Strasser[a], S. Makimura[a], A. Koda[a], K. Shimomura[a], H. Fujimori[a], K. Nakahara[a], K. Nishiyama[a], W. Higemoto[b], K. Ishida[c], T. Matsuzaki[c], Y. Matsuda[c], and K. Nagamine[a,c]

[a] *Meson Science Laboratory, High Energy Accelerator Research Organization (KEK-MSL), Oho, Tsukuba, Ibaraki-305-0801, Japan*

[b] *Japan Atomic Energy Research Center (JAERI), Ibaraki 319-1195, Japan*

[c] *Muon Science Laboratory, The Institute of Physical and Chemical Research (RIKEN), Wako, Saitama 351-01, Japan*

The muon science facility (MUSE) is one of the experimental arenas of the J-PARC project, which was approved for construction in a period from 2001 to 2008, as well as neutron, hadron, and neutrino facility. The MUSE facility is located in the integrated building of the Materials and Life Science Facility (MLF) for neutron and muon. Construction of the MLF building was started in the beginning of 2004, and was just completed in the end of the 2006 fiscal year. We have been working on the installation of the beam line components, expecting for a first muon beam in the summer of 2008.

For Phase 1, we are planning to install one superconducting decay/surface channel with a modest-acceptance (about 40 msr) pion injector, and an estimated surface muons (μ^+) of 3×10^7/s with a beam size of 25 mm in diameter, as well as decay muons (μ^+/μ^-) of 10^6/s for 60 MeV/c and up to 10^7/s for 120 MeV/c with a beam size of 50 mm in diameter are availbale. These intensities correspond to much more than ten times those at RIKEN/RAL Muon facility. In addition to the Phase 1, we are planning to install, one surface muon channel with a modest-acceptance (about 50 msr) and one super omega muon channel with a large acceptance of 400 msr for the study of thin film magnetism or negative muon physics.

In the symposium, a latest status of the J-PARC MUSE and some of the planned experiments will be reported.