# Decay/Surface Muon Channel at MUSE

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Japan Proton Accelerator Research Complex (J-PARC) is now under construction at Tokai Campus of JAEA (Japan Atomic Energy Agency) in Tokai, Ibaraki, Japan with the collaboration of KEK and JAEA. The Muon Science Laboratory is located at Materials and Life Science Facility (MLF) in J-PARC, where 1 MW (3 GeV, 333 $\mu$A) pulsed beam (25Hz 2 bunch) from a 3 GeV rapid synchrotron will be available and, at first, one carbon target of 2 cm thickness planed to be installed for the production of intense pulsed pion and muon beams . To achieve the best performance of this facility, four dedicated muon channels are planned to be installed. The experimental area is divided east and west parts. In this condition, we arranged the superconducting muon channel and the large acceptance surface muon channel (Super Omega) at the west area, and the surface muon channel and the high momentum muon channel at east area.

In this contribution, we will report the present status of the superconducting muon channel construction briefly. In FY 2008, we will obtain first muon beam from J-PARC, by using this muon channel.

A conventional superconducting muon channel will be installed at the south-west part, which can extract surface (positive) muon and decay positive/negative muon up to 120 MeV/c. It consists of three parts; 1) a pion injector, 2) a decay solenoid, 3) a muon extraction. Two experimental ports are planned for simultaneous use.

1) A quadrupole triplet is placed at the position of 65 cm from the carbon target, which can accept pions in a solid angle of 65msr. The following bending magnet transport pions to solenoid up to 250MeV/c in maximum. Therefore Kaon decay muon from the target can also be extracted by adding extra devices.

2) A decay solenoid consists of 12 pieces of superconducting coils with 6cm in bore radius and 50cm in length. The applied magnetic field is 5 T and pions and muons are confined within the radius of 5cm therefore transport without any significant loss. The currently used solenoid in KEK-MSL will be modified for this part. This superconducting solenoid is cooled by on-line He refrigerator (TCF 50).

3) An extraction can transport muons up to 120 MeV/c. A magnetic kicker will be installed for single-pulse experiment by JAEA. The major components of the decay muon channel in KEK- MSL, such as bending magnet, quadrupole magnet and DC separator will be used.

Adding above subjects, the plan for the surface muon channel is also sketched.