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Ultra Slow Muon and Low Energy Muon

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For the studies of surface/subsurface, nano materials and multi layered thin films, as well as for the fundamental physics like g-2 experiments, we must have muon beam, that has sufficiently low energy to stop on or near the surface of the sample. To perform such studies, so called slow (low energy) muons are required with energy that is of the order of several eV to a few tens of keV, far lower than the energies available from the conventional muon beams.
There exist two experimental techniques. One is the low energy ¥mu^{+} which can be generated through the cryogenic moderation method using Van der Waals solids such as solid Ar or N2, has been developed in the following four steps. Another is the ultra slow pulsed muons which can be generated by the resonant ionization of thermal Muonium atoms generated from the surface of a hot tungsten foil, placed at the intense pulsed surface muon beam line.
In this contribution, the latest status of the Ultra Slow Muon Microscopy project at J-PARC MUSE, will be reported, as well as brief status of the low energy For the studies of surface/subsurface, nano materials and multi layered thin films, as well as for the fundamental physics like g-2 experiments, we must have muon beam, that has sufficiently low energy to stop on or near the surface of the sample. To perform such studies, so called slow (low energy) muons are required with energy that is of the order of several eV to a few tens of keV, far lower than the energies available from the conventional muon beams.
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In this contribution, the latest status of the Ultra Slow Muon Microscopy project at J-PARC MUSE, will be reported, as well as brief status of the low energy ¥mu^{+}.

Working Group

WG4 : Muon Physics

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