

DeeMe –muon-electron conversion search experiment–

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The one of an experiment to search for the charged lepton flavor violating process, muon-electron conversion in a nuclear field, DeeMe, is being prepared at the J-PARC MLF H-line in Japan. This experiment utilizes a pulsed proton beam from the Rapid Cycle Synchrotron (RCS). A graphite target is bombarded with a pulsed proton beam and negative pion production and pion-in-flight-decay to negative muon, then creation of muonic atoms are caused in the same pion production target. And a converted electron is expected to emit about after 1~2 micro second delayed timing due to muon atom binding. Also two body reaction of the new process $\mu + (A,Z) \rightarrow e + (A,Z)$ results in 105 MeV monoenergetic electron. Therefore, 1~2 micro second delayed 105MeV monoenergetic electron is a searched signal. Electrons around 100 MeV are transported by the H-Line and analyzed by the dipole magnet (0.4T) and four MWPCs (two upstream of the dipole magnet and two downstream of the dipole magnet).

However, the burst pulse reaching to 10^8 charged particles/pulse attributable to the RCS pulse makes large dead time for the MWPC. So, HV switching scheme is introduced where at the burst time the voltages between anode wires and potential wires set the same so as to lower the gas gain to be $O(1)$ while at the delayed timing the voltages between them set $\sim 1500V$ so as to increase the gas gain to be $O(10^4)$ rapidly. The signal is recorded by the flash ADC and the single electron signal was obtained successfully. The target single event sensitivity is 10^{-13} . At the present moment, all the magnet components of the H-line have been connected with the vacuum pipe, and the commissioning is going on in a good shape. In this talk, the experimental basis, the commissioning status of the H-Line and the DeeMe experiment are presented.

Attendance type

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