

# Development of a micro-cell MWPC for a muon-electron conversion search experiment at MLF H-line, DeeMe

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DeeMe [1] is an experiment to search for a  $\mu$ -e conversion ( $\mu^- + (A, Z) \rightarrow e^- + (A, Z)$ ), which is predicted to be out of experimental reach taking a framework of the Standard Model (SM) of elementary particle physics, hence the discovery of that is expected as a clear evidence of physics beyond the SM. The experiment will be conducted from 2015 at a large acceptance beam line, H-line, to be constructed at J-PARC Material and Life Science Experimental Facility (MLF). The signal  $\mu$ -e conversion electron is characterized by its momentum of 105MeV/c and delayed timing of 2 $\mu$ s with Carbon nucleus (1 $\mu$ s with Silicon nucleus). Detector should precisely measure a momentum of single electron coming after a huge number of prompt timing charged particles. The number of the prompt burst per pulse is calculated to be approximately  $10^8$ , which corresponds to an instantaneous hit rate of 10GHz/mm<sup>2</sup>. In the original design of the DeeMe experiment, we planed to install kicker magnets to kick out prompt burst by a factor of  $10^4$  to protect the detector. We have been developed a micro-cell Multi-Wire Proportional Chamber (MWPC) that can be operated under this condition. In this symposium, we will present about a newly developed technique, HV switching, which will enable the MWPC to be operated even without kicker magnets. The presentation focuses on the development of the MWPC and verification test of the HV switching using surface muon beam available at D2 beam line of J-PARC MLF.

## References

[1] The DeeMe Collaboration, “Proposal to the Experimental Search for  $\mu$ -e Conversion in Nuclear Field at Sensitivity of  $10^{-14}$  with Pulsed Proton Beam from RCS”, December, 2011