

Negative muon spin relaxation/rotation at D-Line MUSE J-PARC

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The D line of the J-PARC MLF MUSE has a pion decay section, where decay muons are available. The superconducting solenoid magnets used in the pion decay section have a large aperture and warm bore, which allows them to guide a wide range of positive and negative muons from high to low momentum. In addition, because the energy of the primary beam of protons is 3 GeV, the highest of any muon facility in the world, the generation efficiency of negative pions, which are primary particles of negative muons, is particularly high, resulting in the world's highest negative muon intensity. Recently, the output power of the proton beam at MLF has reached 1 MW, and in the D1 area where the μ SR spectrometer is installed, various experiments such as the negative muon spin relaxation method and elemental analysis by measuring negative muon lifetimes are being carried out.

Until now, the negative muon beam in D1 was not well tuned and had a wide beam profile. Therefore, various commissioning works have been carried out to produce a higher quality beam[1]. As a result, we succeeded in obtaining a beam with low background and good parallelism. In this talk, I will report the status of beam commissioning at D-line.

References

- [1] S. Takeshita, I. Umegaki, M. Tambo, P. Strasser, Y. Ikedo, A. Koda, W. Higemoto, T. Yuasa, N. Kawamura, Y. Miyake & K. Shimomura, *Interactions* **245**, 38 (2024).
<https://doi.org/10.1007/s10751-024-01877-2>