Contribution ID: **241** Type: **Oral**

Present status of J-PARC MUSE

Tuesday, 30 August 2022 14:20 (15 minutes)

J-PARC MUSE is responsible for the inter-university user program and the operation, maintenance, and construction of the muon beamlines, namely D-line, S-line, U-line, and H-line, along with the muon source at MLF.
At D-line, which provides the world's most intense pulsed negative and positive muon beams, various scientific studies, including those on industrial applications, archeology, and fundamental physics, have been performed. In FY2021, non-destructive analysis was carried out on samples brought back by Hayabusa2 from the asteroid Ryugu, which are thought to preserve the elemental composition of the solar system in its primordial state.
Stable operations have been achieved in S1 area of S-line for μSR. In addition, a group at Okayama University constructed a new experimental area, S2, in FY2020 for muonium 1s-2s measurement.
U-line, uses electrostatic lenses to focus low-energy muons obtained by laser ionization of thermal muonium to produce energy-variable and high time-resolution ultra-slow pulsed muon beams for various experiments. A muon spin spectrometer for materials science research using the μSR method has been installed in the U1A area, and is being upgraded and upgraded for the start of the inter-university user program. The spectrometer is located on a high-voltage stage and the depth of penetration into the sample can be controlled in the range from sub-keV to 30 keV.
The H line is a high-intensity muon beamline where experiments such as high-statistics fundamental physics experiments and transmission muon microscopy are planned. The first beam observed in the H1 experimental area, the first branch, in January 2022.
At present, the beam commissioning is being carried out in collaboration with several research groups that plan to conduct experiments at the H-line.

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Session Classification: Facility Updates

Track Classification: Facility reports