

Current status of the S1 instrument and supporting infrastructure

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The muon facility at MLF, J-PARC has four muon beamlines and eight muon experimental areas. Among the experimental areas, user experiments for muon spin rotation (μ SR) experiments are performed at the S1 and D1 areas [1]. The S1 area is one of the experimental areas of the S line [2] to extract pulsed surface muon beam with a kinetic energy of 4 MeV. At this area, a spectrometer called ARTEMIS [3] is installed as the instrument for conducting μ SR experiments. In this presentation, we will report on the current status and recent progress of the S1 instrument and supporting infrastructure including sample environment.

At the S1 area, there are about 40 user experiments per year, most of which are conducted in 2 or 3 days of beamtime. More than half of the μ SR experiments are conducted with a microstat, a small cryostat using liquid helium as a cryogen, while about 15% of the experiments are conducted with a helium-3 (^3He) cryostat [4]. The installation of vertical cryostats, including the ^3He cryostat, requires access to the spectrometer from the top. To improve the convenience and safety of this access, we installed an aluminum platform. We will report on installation of a new cryostat lifter, which allows the vertical cryostat to be relocated to the standby position without crane operation, as well as recent technical reports on the S1 instrument.

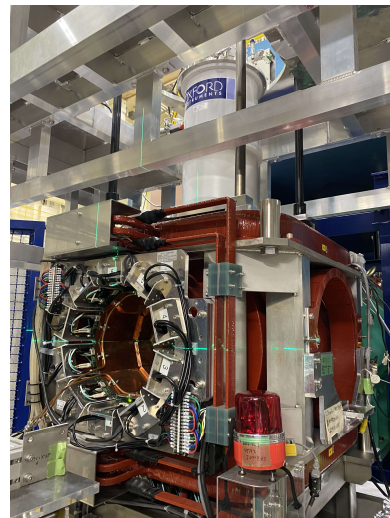


Fig. 1: S1 spectrometer, ARTEMIS, with helium-3 cryostat and cryostat lifter.

References

- [1] <https://mlfinfo.jp/en/s1/>, <https://mlfinfo.jp/en/d1/>
- [2] P. Strasser et al., JPS Conf. Proc. **21**, 011061(1-7) (2018).
- [3] K. M. Kojima et al., JPS Conf. Proc. **21**, 011062(1-6) (2018).
- [4] J. G. Nakamura et al., JPS Conf. Proc. **14**, 011007(1-6) (2024).