

EISCAT_3D and Japan's Activities

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The European Incoherent Scatter (EISCAT) Scientific Association started construction of the first stage of the EISCAT_3D radar in September 2017 under international collaboration. At the first stage, a core site (Skibotn) with a transmission power of about 3.4 MW Tx power (~6700 SSPA) and two receive-only remote sites (Kaiseniemi and Karesuvanto) will be operated. As of today, first light of the EISCAT_3D radar is scheduled by the end of 2023. It is planned to have the system ready for monostatic operations in 2024, and tri-static operations will follow after developing the legal status of the EISCAT organisation. The ground preparation for the three sites is in progress, and each radar unit has been installed at the sites. The EISCAT_3D radar will be utilized for a variety of science cases (McCrea et al., 2015), including study on energy and mass transport from the solar wind and magnetosphere to the ionosphere and atmosphere.

The National Institute of Polar Research (NIPR) has been contributing to the EISCAT_3D construction by supplying radar transmitter power amplifiers (SSPAs) in collaboration with the EISCAT scientific association and ISEE, Nagoya University. The high energy-efficient SSPAs have been used for engineering verification tests at the EISCAT Tromsø and Kiruna sites since 2016. In February 2020, NIPR concluded a MoU with EISCAT to supply in-kind Subarray Transmitter Units which are selected for the first stage by the EISCAT Headquarters through the international tendering process. In addition to these contributions to the EISCAT_3D construction, NIPR established the Advanced Radar Research Promotion Center (ARRC) in April 2022. The Center has several NIPR staff scientists and visiting researchers who are working towards the joint usage and collaborative research of the EISCAT_3D radar.

In this paper, we report and discuss the prospects of Japan's activities for the EISCAT_3D project.

Reference

McCrea, I. W., A. Aikio, L. Alfonsi, E. Belova, S. Buchert, M. Clilverd, N. Engler, B. Gustavsson, C. Heinselman, J. Kero, M. Kosch, H. Lamy, T. Leyser, Y. Ogawa, K. Oksavik, A. Pellinen-Wannberg, F. Pitout, M. Rapp, I. Stanislawska, J. Vierninen, The science case for the EISCAT_3D radar, *Progress in Earth and Planetary Science*, doi:10.1186/s40645-015-0051-8, 2015.