EISCAT_3D and Japan's Activities

Yasunobu Ogawa[1,2], Hiroshi Miyaoka[1], Satonori Nozawa[3], Taishi Hashimoto[1,2], Shin-ichiro Oyama[3], Koji Nishimura[4], Takuo Tsuda[5], Hitoshi Fujiwara[6], Masaki Tsutsumi[1,2], Yoshimasa Tanaka[1,2], Takanori Nishiyama[1,2], Mizuki Fukizawa[1], Takuji Nakamura[1,2], Ryoichi Fujii[7], Craig Heinselman[8]

[1]*National Institute of Polar Research*

[2]*The Graduate University for Advanced Studies, SOKENDAI*

[3]*ISEE, Nagoya University*

[4]*RISH, Kyoto University*

[5]*The University of Electro-Communications*

[6]*Seikei University*

[7]*Research Organization of Information and Systems*

[8]*EISCAT Scientific Association*

The European Incoherent Scatter (EISCAT) Scientific Association started construction of the first stage of the EISCAT_3D radar in 2017 under international collaboration. The EISCAT_3D radar is expected to be operational in 2023. At the first stage, a core site with a transmission power of about 4~5 MW and two receive-only remote sites will be operated. The ground preparation for the three sites is completed by 2022, and each radar unit is installed at the sites in 2022 and 2023. The EISCAT_3D radar is expected to be utilized for a variety of science cases, including study on energy and mass transport from the solar wind and magnetosphere to the ionosphere and atmosphere. The results and real-time data distribution will contribute to space climate research and space weather forecasting.

The National Institute of Polar Research (NIPR) had 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 has concluded an 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. After these contributions to the EISCAT_3D construction, NIPR establishes the Advanced Radar Research Promotion Center in April 2022 to promote joint usage and collaborative research of the EISCAT_3D radar.

In this paper we present the latest status of the EISCAT_3D implementation and discuss the prospects for Japan's EISCAT_3D activities.