

Recent Progress and Current Status of EISCAT_3D in 2018-2019

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The European Incoherent Scatter(EISCAT) Scientific Association with associate members from Sweden, Norway, Finland, UK, China and Japan, has officially started the construction of the 1st stage of EISCAT_3D from September 2017 toward its completion by the end of 2021, including the commissioning of the radar system. EISCAT 3D is the major upgrade of the existing EISCAT mainland radars, with a multi-static phased array system composed of one central active (transmit-receive) site and 4 receive-only sites to provide us 50-100 times higher temporal resolution than the present system. The construction of EISCAT 3D is planned to implement by 4-staged approach, starting from the core site with half transmitting power about 5MW at Skibotn (Norway) and 2 receiving sites at Kaiseniemi (Sweden) and Karesuvanto (Finland) at the 1st stage. As for site preparation, geotechnical surveys have been completed at three sites, and ground cleaning with trenching for power lines and optical fiber cables have almost finished at the core site, Skibotn. All site buildings are scheduled to be built in 2019 to start installation of the radar system from 2020.

Through the international tendering process led by the EISCAT headquarter, antenna units with housing containers, first stage receiver units, sub-array transmitter units and pulse and steering control units have been completed and contracted providers have just started their preparation for productions to meet the EISCAT_3D implementation plan for sub-systems in 2020.

National Institute of Polar Research has been pursuing the opportunity to contribute in-kind to the construction of EISCAT_3D by supplying radar transmitter units in cooperation with the EISCAT Headquarters and ISEE/Nagoya University. The EISCAT_3D program in Japan was successfully granted as as one of high-priority programs of the Master Plan 2014/2017 and the Roadmap 2014 program, as a core facility of ' Study of Coupling Processes in the Solar-Terrestrial System' (PI: Prof. Toshitaka Tsuda, ROIS/Kyoto Univ.). Supported by these positive evaluations, high energy-efficient transmitter power amplifiers (SSPAs) has been developed and produced for the engineering verification test at the EISCAT Tromso site with partial fundings for development since 2016.

In this paper, we will overview the recent progress and current status of the project including our strategy for the transmitter units as our national contribution to the EISCAT_3D project.

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