

EISCAT_3D: Recent Progress and Current Status on Japan's Contribution

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On 12 June 2017, the European Incoherent Scatter(EISCAT) Scientific Association with associate members from Sweden, Norway, Finland, UK, China and Japan, has officially announced to start the implementation of the 1st stage of EISCAT_3D from 1 September 2017 to be completed by the end of 2021 including the commissioning of the radar system. The technical design work has been almost finalized and the project has now entered a new phase of actual construction. The Swedish Research Council, the Academy of Finland, the Research Council of Norway, the Natural Environment Research Council of UK and the European Commission have secured funds for the development, construction and operation of EISCAT_3D, which covers approximately 85% of the total costs of establishing the first stage of the 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.

The Japanese EISCAT group based at the EISCAT_3D promotion office, National Institute of Polar Research has been pursuing the opportunity to contribute in-kind to the construction of EISCAT_3D by supplying power amplifiers for the radar transmitters in cooperation with the EISCAT Headquarters and Japanese industries. The EISCAT_3D program in Japan has been successfully granted as one of high-priority programs of the Master Plan 2014/2017 and the Roadmap 2014 program, as a part of 'Study of Coupling Processes in the Solar-Terrestrial System' (PI: Prof. Toshitaka Tsuda, ROIS/Kyoto Univ.). Supported by these positive evaluations, National Institute of Polar Research has been submitting a funding proposal to the Ministry for EISCAT_3D, collaborating with the Institute for Space-Earth Environmental Research, Nagoya University. Since 2016, with partial fundings for development, high energy-efficient transmitter power amplifiers (SSPAs) has been produced for the engineering verification test using a test sub-array system at the EISCAT Tromsø site. In this paper, we will overview the recent progress on the project including our development for the EISCAT_3D SSPAs and outlook on Japan's national contribution to the EISCAT_3D project.

<http://eiscat.nipr.ac.jp/eiscat3d/>

<https://eiscat3d.se/node>

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