

Current Status of EISCAT_3D and Japan's Contribution

*Hiroshi Miyaoka¹, Satonori Nozawa², Yasunobu Ogawa¹, Takuji Nakamura¹, Shin-ichiro Oyama², Ryoichi Fujii², Craig Heinselman³

1.National Institute of Polar Research, 2.Institute for Space-Earth Environmental Research, Nagoya University, 3.European Incoherent Scatter Scientific Association

The European Incoherent Scatter(EISCAT) Scientific Association with associate members from Sweden, Norway, Finland, UK, China and Japan, including affiliated member organizations from South Korea, France and EC, is planning for the construction of the next generation near-earth space and upper atmosphere radar system in northern Feno-Scandinavia, called EISCAT_3D. The technical design work is currently being almost finalized and the project has now entered the new phase of production engineering. The Swedish Research Council, the Academy of Finland, the Research Council of Norway and the European Commission have now granted funds for the development, construction and operation of EISCAT_3D, which covers approximately 70% 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 Bergfors (Sweden) and Karesuvanto (Finland) at the 1st stage. The Japanese EISCAT user community has been pursuing the opportunity to contribute in-kind to the construction of EISCAT_3D. Our proposal is to supply the power amplifiers for the radar as a joint venture with EISCAT in cooperation with Japanese industry. The EISCAT_3D program in Japan has been successfully granted as one of 27 high-priority programs of Master Plan 2014 and 10 new Roadmap 2014 programs as a part of 'Study of Coupling Processes in the Solar-Terrestrial System' (PI: Prof. Tsuda, Kyoto Univ.). Supported by this decision, National Institute of Polar Research has made a funding proposal to MEXT for EISCAT_3D, collaborating with Institute for Space-Earth Environmental Research, Nagoya University. In parallel to the funding proposal, we started a development for a high energy-efficient power amplifier collaborating with the EISCAT headquarter and Japanese industry. In this paper, we will overview the current status and outlook on Japan's national contribution to the EISCAT_3D project. Figure. Location of existing EISCAT radar and planned EISCAT_3D radar sites.

Keywords: incoherent scatter, radar, arctic, geospace

