

EISCAT_3D (Next-Generation IS Radar Project for Atmospheric and Geospace Science) and EISCAT: Current status and roadmap

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The EISCAT Scientific Association (current member countries: China, Finland, Japan, Norway, Sweden and United Kingdom) is actively preparing for the construction of its next-generation radar, which will provide comprehensive 3D monitoring of the lower/middle/upper atmosphere and ionosphere. The EISCAT_3D radar will consist of multiple phased arrays, using the latest signal processing and beam-forming techniques to achieve ten times higher temporal and spatial resolution than the present radars. EISCAT_3D will be a volumetric radar, capable of imaging an extended spatial area with simultaneous full-vector drift velocities, designed for continuous operation modes, short-baseline interferometric capabilities for sub-beamwidth imaging, real-time data access and extensive data archiving facilities. The highly modular and expandable design envisages a system with at least one circular active array comprising 16,000 antennas. This central site will also include outlying antennas for imaging applications. At least four smaller remote sites, comprising receiving arrays of some 8,000 antennas will be located between 50 and 150km from the central site.

In 2008, the European Strategy Forum on Research Infrastructures (ESFRI) selected EISCAT_3D for inclusion in its roadmap of large-scale European environment research infrastructures for the next 20-30 years. In 2010, the EISCAT_3D Preparatory Phase Program (2010-2014) started following the EISCAT_3D Design Study Program(2005-2009), funded by EU.

In this paper, we present the current situation of the EISCAT and the EISCAT-3D project including the scientific capabilities in order to call for interests and to form consortium among the domestic user communities.

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