



EISCAT_3D – A Multi-Static Phased-Array Incoherent Scatter Radar in Northern Fenno-Scandinavia

Anders Tjulin*⁽¹⁾, Thomas Ulich⁽¹⁾, Axel Steuwer⁽¹⁾

(1) EISCAT Scientific Association, Kiruna, Sweden, e-mail: anders.tjulin@eiscat.se; thomas.ulich@eiscat.se; axel.steuwer@eiscat.se

The EISCAT_3D radar system, which is under construction in the Fenno-Scandinavian Arctic, will be a world-leading international research infrastructure using the incoherent scatter technique to study geospace. EISCAT_3D consists of three phased array antenna sites located in northernmost Norway, Sweden and Finland that, thanks to modern signal processing and radar techniques, will be able to obtain observations with significantly higher resolution than is possible with currently operating radar systems. In addition, EISCAT_3D will be constructed to manage continuous operation and will be able to carry out simultaneous observations within a large volume of the ionosphere above northern Scandinavia, making EISCAT_3D both a good instrument for detailed studies of space weather impacts on the ionosphere as well as for model verification. The EISCAT_3D radar system will be operated by EISCAT Scientific Association and thus be an integral part of an organisation that has successfully been running incoherent scatter radars for more than forty years.

The array site at Skibotn, Norway, will have both transmitting and receiving possibilities and it consists of around 10000 aerals plus ten 91-aerial outrigger receivers in the immediate vicinity. The receive-only array sites at Kaiseniemi, Sweden, and Karesuvanto, Finland, each consist of about 5,000 aerals each. The construction of the system started after a project kick-off in September 2017. During 2024, EISCAT_3D will gradually begin operations, starting with a seven-element test system and expanding the operations from that.

Here we will present an overview of the present status and plans for the EISCAT_3D system.