Japan Geoscience Union Meeting 2015
(May 24th - 28th at Makuhari, Chiba, Japan)

PEM10-23 Room:A01 Time:May 28 15:45-16:00

A new perspective on atmospheric and geospace science in the Arctic with EISCAT_3D - Japan's contributions -

MIYAOKA, Hiroshi[1*] ; NOZAWA, Satonori[2] ; OGAWA, Yasunobu[1] ; OYAMA, Shin-ichiro[2] ; NAKAMURA, Takuji[1] ; FUJII, Ryoichi[2] ; HEINSELMAN, Craig[3]

[1]National Institute of Polar Research, [2]Solar-Terrestrial Environment Laboratory, Nagoya University, [3]EISCAT Scientific Association

The European Incoherent Scatter(EISCAT) radar system in northern Feno-Scandinavia and Svalbard have been playing a pivotal role in advancing cutting edge sciences in various area including atmospheric, ionospheric and geospace studies, space weather and global change. Affiliated in the EISCAT scientific association in 1996, Japanese science community has jointly contributed to understanding of the magnetosphere-ionosphere-thermosphere coupling processes using the coordinated ground-based and rocket/satellite simultaneous observations with EISCAT radars.

EISCAT_3D is the major upgrade of the existing EISCAT mainlamd 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 core site will transmit signals at 233MHz with about 10MW power, and all five sites will have sensitive receivers to detect the returned signal using phased-array antenna with10,000 elements.

The construction of EISCAT_3D is planned to implement by 4-staged approach, starting from the core site with half transmitting power about 5MW and 2 receiving sites at Bergfors (Sweden) and Karesuvanto (Finland) at the 1st stage. The transmitter will be upgraded to full-scale of 10MW at 2nd stage, then another receiving sites will be constructed at Andoya (Norway) and Jokkmokk (Sweden) at the 3rd and 4th stages.

In parallel to developing design studies and the science case for EISCAT_3D, associate member countries have been making best efforts to secure their national fundings. The EISCAT_3D program in Japan was applied to the call for Master Plan 2014 as a part of 'Study of Coupling Processes in the Solar-Terrestrial System' (PI: Prof. Tsuda, Kyoto Univ.). After granted as one of 27 high-priority programs of Master Plan 2014 and 10 new Roadmap 2014 programs, National Institute of Polar Research has made a funding proposal to MEXT for EISCAT_3D, collaborating with Solar-Terrestrial Environment Laboratory, Nagoya University.

In this paper, we will overview the current status of Japan's national contribution to the EISCAT_3D program as well as the scientific targets which are focussed by the Japanese science community.

Keywords: incoherent scatter, radar, arctic, geospace