

## SuperDARN Hokkaido Pair of radars – Past Achievements and Future Perspectives

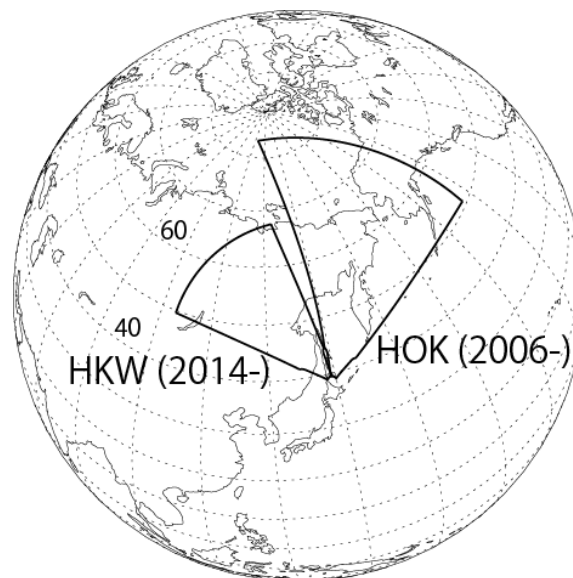
Nozomu Nishitani<sup>(1)</sup>

(1) ISEE, Nagoya University, Nagoya, Japan; e-mail: nishitani@isee.nagoya-u.ac.jp

Super Dual Auroral Network (SuperDARN) is a network of High-Frequency (HF) coherent scatter radars located at high- and mid-latitudes in both hemispheres. It is operated under the international collaboration of about ten countries. More than 35 SuperDARN radars are monitoring the ionosphere and upper atmosphere dynamics. The initial SuperDARN's field of view was limited to high latitudes poleward of about 60 degrees geomagnetic latitude. However, starting from about 2005, its coverage expanded to lower latitudes to monitor the ionospheric disturbances during geomagnetically active periods at auroral latitudes and activities at sub-auroral and mid-latitude regions.

The SuperDARN Hokkaido Pair of (HOP) radars, consisting of the Hokkaido East (HOK) and Hokkaido West (HKW) radars, are located at the lowest geomagnetic latitude (MLAT) among the current SuperDARN radars (Figure 1), covering the mid-latitude ionosphere as low as about 40 degrees MLAT. The unique geographic environments led us to several new scientific achievements (please refer to Nishitani et al. [2019] for details).

This paper will review past scientific accomplishments of the SuperDARN Hokkaido Pair of radars. Selected topics are as follows: (1) study of the characteristics of Sub-Auroral Polarization Streams (SAPS). (2) Study of the characteristics of Traveling Ionospheric Disturbances, including Medium-Scale TIDs (MSTIDs) and Large-Scale TIDs (LSTIDs). In addition, future perspectives on the HOP radars will also be presented. They include the development of the remote HF radar wave receivers and implementing of the imaging capability using the USRP Software Digital Radio (SDR) device.



**Figure 1.** Fields of view of the SuperDARN Hokkaido Pair of radars, consisting of the Hokkaido East (HOK) and Hokkaido West radars.

## References

- [1] Nishitani, N., Ruohoniemi, J.M., Lester, M. et al. Review of the accomplishments of mid-latitude Super Dual Auroral Radar Network (SuperDARN) HF radars. Prog Earth Planet Sci 6, 27 (2019). <https://doi.org/10.1186/s40645-019-0270-5>