

## 2025年度 14) 国際技術交流 目次詳細

### 2025 14) International Technical Exchange Program List

1 件

\*所属・職名は2026年3月現在

\*Affiliation and Department displayed are current as of March 2026.

研究代表者 Principal Investigator	所属機関* Affiliation	所属部局* Department	職名* Job title	研究課題名 Project Title	頁 Page	備考 Remarks
Theodore Kolkman	University of Saskatchewan, Canada	Physics and Engineering Physics	Research Engineer	SuperDARN Technical Exchange	389	

## SuperDARN Technical Exchange

Theodore Kolkman (University of Saskatchewan)

Please write your research summary including purpose, methods, periods of stay in ISEE / International stay, achievements obtained from the program, and list of publications in maximum two pages.

日本語または英語のどちらかで作成してください。

Please use A4 paper size (210×297 mm) with margin (top and bottom 20 mm, left and right 20 mm).

During the period of October 6<sup>th</sup> to 20<sup>th</sup>, Theodore Kolkman and Remington Rohel from the University of Saskatchewan visited ISEE at Nagoya University. The purpose of this visit was to exchange information on the operation of our respective SuperDARN radar operations and sharing updates on recent developments in our research groups. Below is an overview of the topics discussed during the stay in Japan.

### **Discussions with Yoshiyuki Hamaguchi**

We met with Mr. Hamaguchi several times during our visit. He gave us an update on the Hokkaido imaging receiver development during our first informal meeting. Next, Mr. Hamaguchi showed us the hardware he was working on in his lab. There we saw the imaging receive equipment in the lab and were able to understand better how the system worked. The system used similar devices as our own radar system, so we discussed the similarities and differences between our respective systems. Mr. Hamaguchi also showed us the Hokkaido transmitter electronics. One concern he had was how to interface between the USRPs used in the imaging receiver and the transmitters. After referencing documentation shared by Dr. Nishitani, we were able to explain how Borealis' transmitter interfacing mechanisms could be applied to the Hokkaido system.

### **Shota Hayamizu's master project**

We collaborated with Dr. Nishitani and his grad student, Shota Hayamizu, on Mr. Hayamizu's project processing data from the Hokkaido imaging receiver. We received a presentation from Mr. Hayamizu on the details of his work and met with him and Dr. Nishitani several times to discuss the results of his work and provide suggestions on how to remedy issues that Mr. Hayamizu encountered. We were able to help Mr. Hayamizu resolve an issue with his method of testing his digital filter implementation. We gained valuable insight into the operation of the Hokkaido imaging receiver as a result of this collaboration.

### **Sharing information our developments**

Over several meetings with Dr. Nishitani and his SuperDARN research group we shared recent developments with SuperDARN Canada and our own radar systems. We highlighted some of the new experimental capabilities our radars can perform, such as clear frequency search. We also shared some of our operational practices regarding reducing downtime of our radars. Finally, we gave a presentation on the newly developed receive path circuitry installed at the SuperDARN Canada radars. We showed block diagrams of the design, CAD models, and results of testing showing the improvement of the new circuitry.