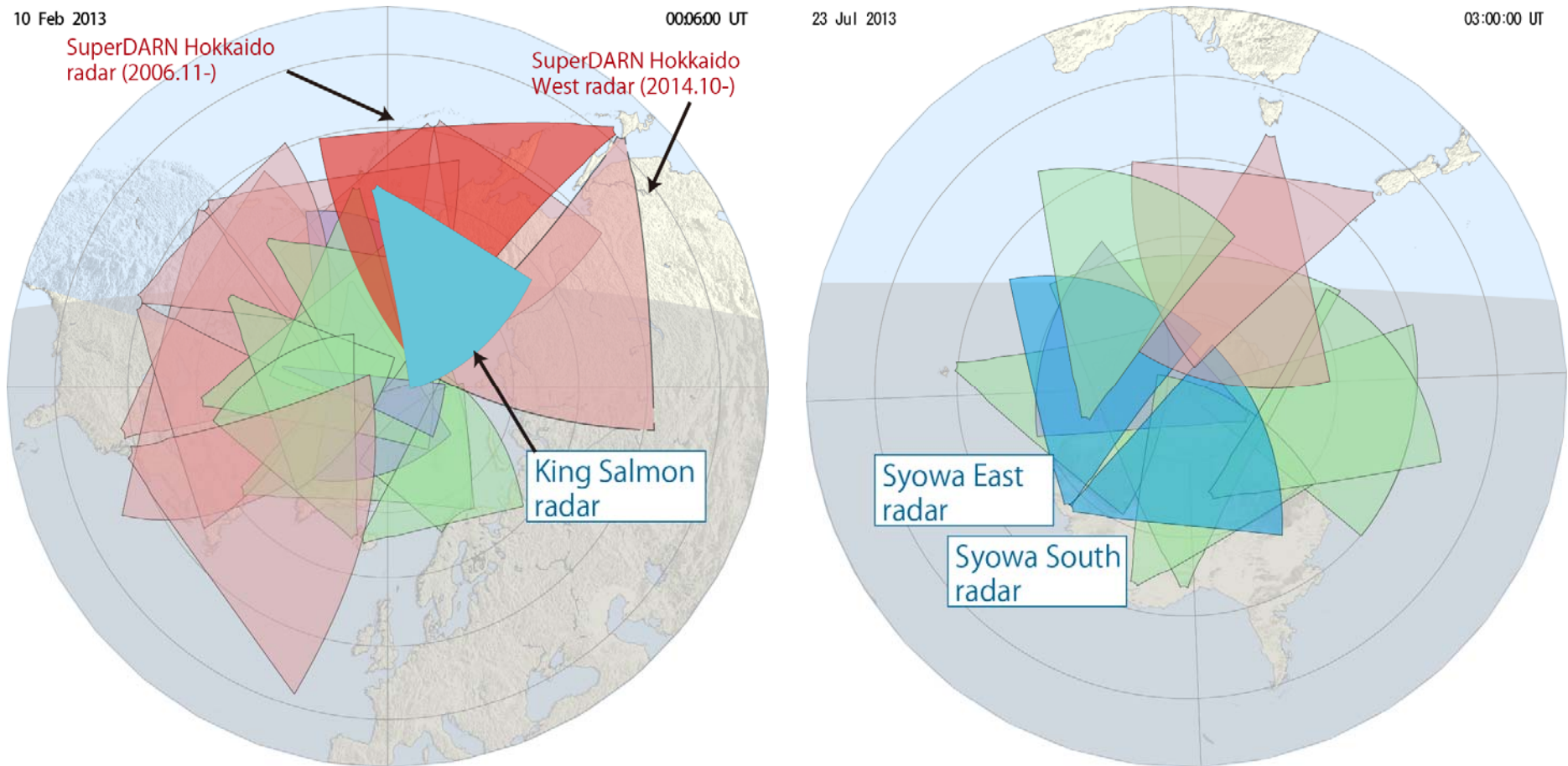


# Status report on the SuperDARN HOP (Hokkaido pair of) radars SuperDARN北海道-陸別第一・第二HFレーダー (SuperDARN HOP radars)の現状について

SuperDARN HOP West radar (2014.10-)

Nozomu Nishitani (ISEE, Nagoya Univ.)

# Super Dual Auroral Radar Network (SuperDARN)



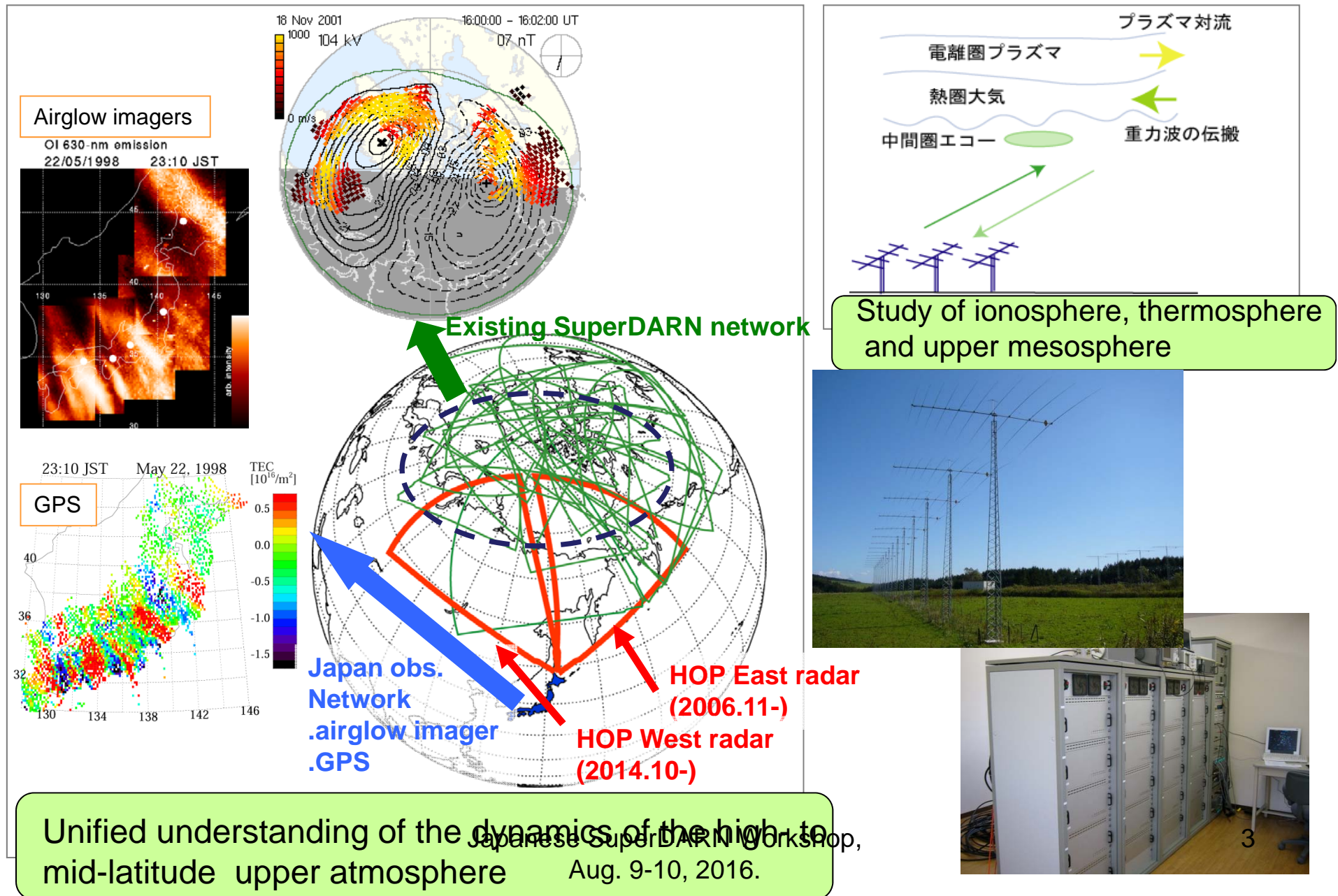
Number of operating HF radars: 35 (23 in the northern and 12 in the southern hemispheres) as of Jan 01, 2016

Standard temporal resolution: 1-2 min

Japanese SuperDARN Workshop,  
Aug. 9-10, 2016.



# SuperDARN HOP radars (2006.11-) # of papers: 32



# Latest status: Network link to HOP radars is stopped since Aug 03 (this year)!

- Aug 03, 04-05 UT: thunderstorms caused cutoff of the network link between the radar site and the observatory (it happened to be during Nishitani's business trip in China!) At that moment both radar had no problem.
- Sometime after that: electric power failure happened for a short period, leading to the stoppage of the HOP East radar.
- Aug 08, 05-06 UT: Yokozeki-san (Rikubetsu Observatory) restarted the HOP East radar after rebooting the main computer. It seems to be working ok. The HOP West radar seems to be working continuously.
- As of Aug 09: The network link is still down, but we identified the cause in the Wifi relaying device at the radar site. The local electric company is preparing for the replacement with a spare device.

# Thunderstorm damage also occurred in August 2015

- The lightning strike damaged the wifi relaying devices at the radar site and ex-15m tower on Aug 11.
- The damaged devices were replaced with spares on Aug 13. However, another lightning strike damaged the devices again on the same day!
- At that time we did not notice that the HOP West air-conditioner was stopped, leading to very high temperature at the HOP West site (see the last year report on the web).
- The network was finally resumed on Aug 24.
- The lightning strikes also damaged the ntp server at the HOP West site, making the clock of the HOP West data unstable (displacement as large as 105 seconds). It seems that the main computer motherboard was also damaged (it does not recognize the DSC-200/300 card properly). We are now running the HOP West radar using the simulator main computer and the spare DSC-LP300 card.

# Malfunctioning of HOP West transmitters

- During the annual visit to the radar site together with JARE team during Sep 22-24, we found out that 6 transmitters were malfunctioning.
- We decided to send all of them to the Leicester in October, but Sessai (who was visiting the site for testing his imaging radar device for Syowa South radar) found difficulty in resetting the transmitters via RF485 communication. He temporally solved the problem but finally it became impossible to reset the transmitters. Accordingly, the HOP West radar was stopped for about a month.
- Finally all the repaired transmitters arrived and we restarted the HOP West radar in fully operation mode on December 8.

## Another issue: misplacement of chA/ chB cables at the HOP West radar

- Since the beginning of the HOP West radar in October 2014, we noticed that during the chB camping beam mode the radar has significantly reduced echo power, but we did not know the cause for this.
- In October 2015 Sessai pointed out that possibility that the cabling was misplaced between chA and chB
- In November and December 2015 Nishitani visited the radar site and confirmed that the transmitter line connected to the T/R switch circuit was misplaced.
- The problem was fixed on December 8, 2015.

Known data problems reported to DDWG:  
<http://vt.superdarn.org/tiki-index.php?page=Data+Dist+Working+Group>

- 20160216.0554 - 20160328.0908: hkw From Nozomu: During this time the transmitting signal input to the phasing matrix was interchanged between channel A and B AND the radar operated with different beams between channel A and B. For these files data should be handled with care when there are echoes along the camping beam (bm5) direction (mixing of two beams will happen). When there are no echoes along the camping beam the data are much less problematic.



# HOP West radar: unsolved issues

- Maximum range issue (we want to change from 70 to 110 but we do not know how to do it)
- We have been chB camping beam mode since Dec 08, 2015 with scanning frequency, but we want to fix its frequency sometimes. Which frequency should we choose (9/10 MHz: interfere with chA, 15/18 MHz: less echoes)?
- Access limited during the winter time
- General issue: The network link to the HOP East / West sites is sometimes unstable, but we do not know the reason (maybe wifi wave affected by rainfall / snowfall?)

# HOP East issue

- Both BASBOX's still having a problem in chA but we can use chB (HOP East is a mono radar) without a problem, so probably it is ok.
- HOP East has much more echo power than West (HOP West has much less). We still need to investigate this.

# HOP East / West scheduling

- HOP East
  - Follows the scheduling Workgroup
  - Discretionary time: run “interleaved normalscan”
- HOP West
  - chB camping beam (#5) mode since Dec 08, 2015

**SuperDARN** Hokkaido Radar  
北海道-陸別HF レーダー

Solar-Terrestrial Environment Lab. Nagoya University

Home Information DATA Photo Album Workshop Member Publication List Essay Link

News:

- Web system updated.
- The [leaflet](#) is available.

What's New:

- 2015/6/09 Web system updated.
- 2015/05/26 The [leaflet](#) is available.
- 2014/11/27 [Essay page](#) is available.
- 2014/06/02 [SuperDARN in virtual reality](#) is available.
- 2014/03/12 The [leaflet](#) is available.
- 2014/01/14 [Movie Gallery page](#) is available.
- 2013/08/22 [Summary plot for each beam](#) is available now for browsing.
- 2013/04/22 [Link page](#) updated.
- 2012/09/06 [STEL Newsletter articles about SuperDARN](#) are available.
- 2011/08/02 This website was renewed.
- 2011/07/08 [Publication list](#) updated.
- 2011/05/19 [Radar operation history](#) added.
- 2009/04/16 [Publication list](#) updated.
- 2008/04/19 [King Salmon radar information](#) added.
- 2008/04/19 Publication list now accessible.
- 2007/01/19 [SuperDARN Workshop 2007 Website](#) Open.
- 2007/01/16 [Quicklook Data](#) are available.
- 2006/11/20 Website Open

Summary Plot Ea

Summary Plot W

Hokkaido - King Salmon Joint Plot Movie

Information

SuperDARN Old Web

Contact: Nozomu Nishi  
[nisitani@stelab.nagoya-u.ac.jp](mailto:nisitani@stelab.nagoya-u.ac.jp)  
TEL 052-747-63  
FAX 052-789-5

Last Update: March 12, 2

IUGONET

This data has been registered IUGONET (Inter-university Upper atmosphere Global Observation NETwork) metadata database. TI IUGONET metadata database will be great help to researchers in efficient finding and obtaining ground-based observation data spread over the institutes/universities. Click and visit the IUGONET website

# SuperDARN HOP (Hokkaido Pair of) radars web page

New URL:

<http://cicr.isee.nagoya-u.ac.jp/hokkaido/>

Japanese SuperDARN Workshop, Aug. 9-10,  
2016.

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# Informal information for other SuperDARN radars

- Visit to ISTP, RAS SB in Irkutsk (July 18 – 21) (N. Nishitani, Shiokawa)
  - Discussion on the collaboration between ISTP and Japanese PWING group, as well as some conversation about SuperDARN / Russian HF radar
- Visit to NSSC in Beijing, China (Aug 04) (Nishitani, J.B.H. Baker)
  - Exchange of information on the SuperDARN radar and their AgileDARN



# Announcement: Rikubetsu radar site 10<sup>th</sup> anniversary symposium

- Joint with Rikubetsu observatory 20<sup>th</sup> anniversary symposium
- Tentative schedule: November 14-16, 2016?
- Place: Rikubetsu
- Announcement will be made soon

# Japanese SuperDARN Mailing list

- ML address: [sdjapan@isee.nagoya-u.ac.jp](mailto:sdjapan@isee.nagoya-u.ac.jp)
- Mailing list for exchanging information on SuperDARN (and related activities) and discussion related to SuperDARN
- Anyone interested in SuperDARN can join!

# ISEE/CICR International Workshop: Review of the Accomplishments of the Mid-Latitude SuperDARN Network (approved)

- ISSI-style workshop
- Closed (about 10 participants)
- the main purpose is to write up a review paper or special issue papers
- Leader: Nozomu Nishitani
- General review: Nozomu Nishitani, Mark Lester and Mike Ruohoniemi
- Other planned participants: Gareth Chisham, Jim Wild, Aurelie Mauchaudon, Sasha Koustov, Roman Makarevich, Tomoaki Hori (and probably more)
- Dates: Jan 10-14, 2017.
- Place: ISEE, Nagoya University

# Other topics

- EPS special issue “Coupling of the High- and Mid-latitude ionosphere and its relation to geospace dynamics”: reviewing process completed (accepted papers: 12). The final task is just to write a preface!
- Visit to the radar site during Sep 7-10 together with JARE team members
- Pasha Ponomarenko (12/16 – 3/31) and Jo Baker (1/1 – 6/30) will be visiting ISEE, Nagoya Univ. to do collaborative studies

# Funding issue

- Kazuo Shiokawa succeeded in obtaining a fund of GRANT-IN-AID FOR SPECIALLY PROMOTED RESEARCH called PWING (Study of dynamical variation of Particles and Waves in the INner magnetosphere using Ground-based network observations)
  - It will continue for 5 years
  - The main target is to study wave-particle interaction although the SuperDARN electric field observation is included.
- Japan-South Africa bilateral proposal was not approved for 2016 but we are planning to propose for 2017 again.
- Kakenhi Kiban (B) proposal (leader: Nishitani) for 2016 was not approved but we are planning to propose for 2017 again.



# Summary

- Both HOP East / HOP Wes radars have been working although they (especially HOP West) had several problems. For details please see:

[http://cicr.isee.nagoya-u.ac.jp/hokkaido/hok\\_operation.txt](http://cicr.isee.nagoya-u.ac.jp/hokkaido/hok_operation.txt)

[http://cicr.isee.nagoya-u.ac.jp/hokkaido/hkw\\_operation.txt](http://cicr.isee.nagoya-u.ac.jp/hokkaido/hkw_operation.txt)

- New SuperDARN HOP web page
  - anniversary conference in Rikubetsu
  - ISEE/CICR International Workshop
  - EPS special issue
  - Visiting scientists
  - PWING
  - SD Japan Mailing list
  - Etc.
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- ERG-SuperDARN discussion time is scheduled tomorrow