



Arase-SuperDARN collaboration

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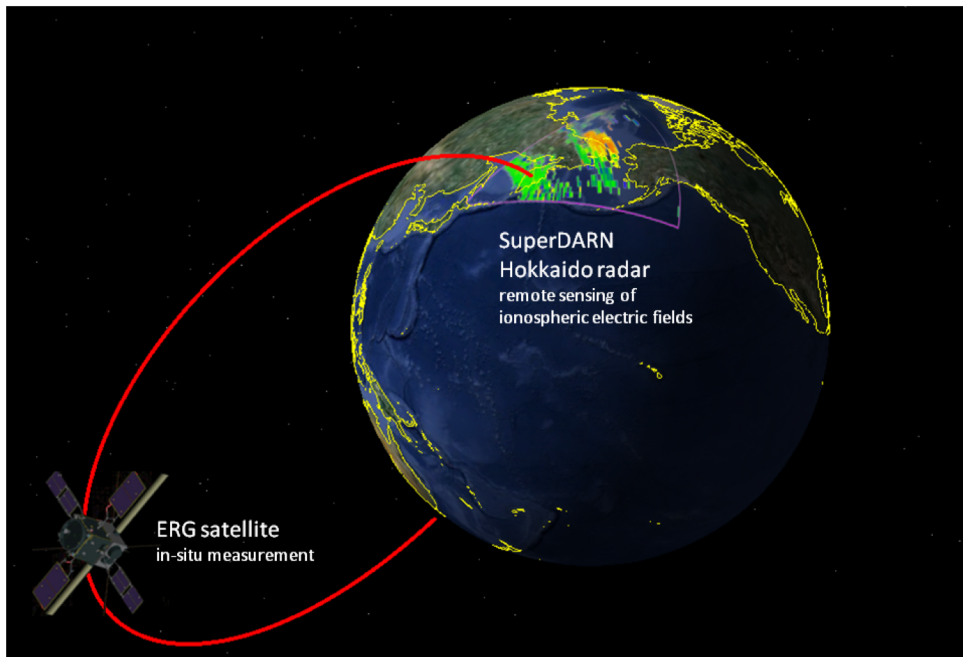
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- ▶ (Previous) 2017 Spring–Fall campaign
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SuperDARN-Arase conjunction



Memorandum for ERG and SuperDARN collaborative studies

Authors:

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1. Executive summary

This memorandum has been prepared and maintained by the ERG-SuperDARN collaboration task team to share strategies, ideas, and actual plans of collaborative studies based on observational data obtained by SuperDARN and the ERG satellite, with the researchers who are interested in the collaborative studies. This document is also going to provide ancillary information on the resources available for the ERG-SuperDARN collaboration.

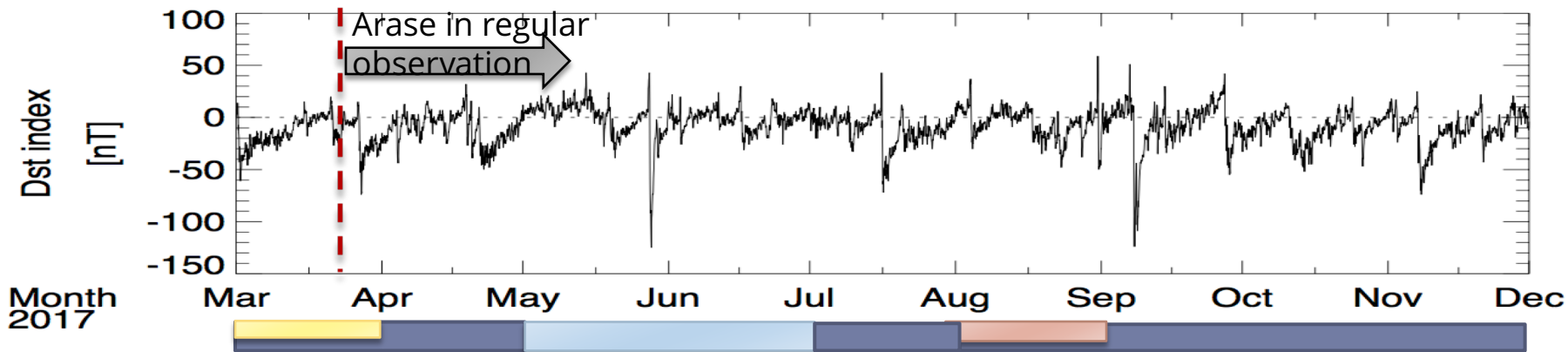
2. Introduction

- ▶ For successful campaign observations, purposes, scientific strategies, and plan of the SD-Arase collaborative observations were **summarized in the memorandum**, which has been publicly available at:
<https://docs.google.com/document/d/12VTcxrqNsa6ymo7al5A0sswUE2IKnV3gu2Ew1U367YA/edit#heading=h.17o0hjh2tk5n>
- ▶ **Fitacf data in CDF and some plug-in tools for SPEDAS** were developed and have been made available as a part of the SPEDAS distribution [Hori+, 2012, 2015] to facilitate data analyses with SD, Arase, and other various data.



(Previous) SD campaign for Arase

Period: March–November, 2017



- ▶ The Arase campaign observation with either of the following special modes were carried out for ~70-80 hours per month on average as requested via the spacecraft WG.

▶ Mar–Apr, Jul–Nov, 2017: **interleaved normalscan** (T. Hori)

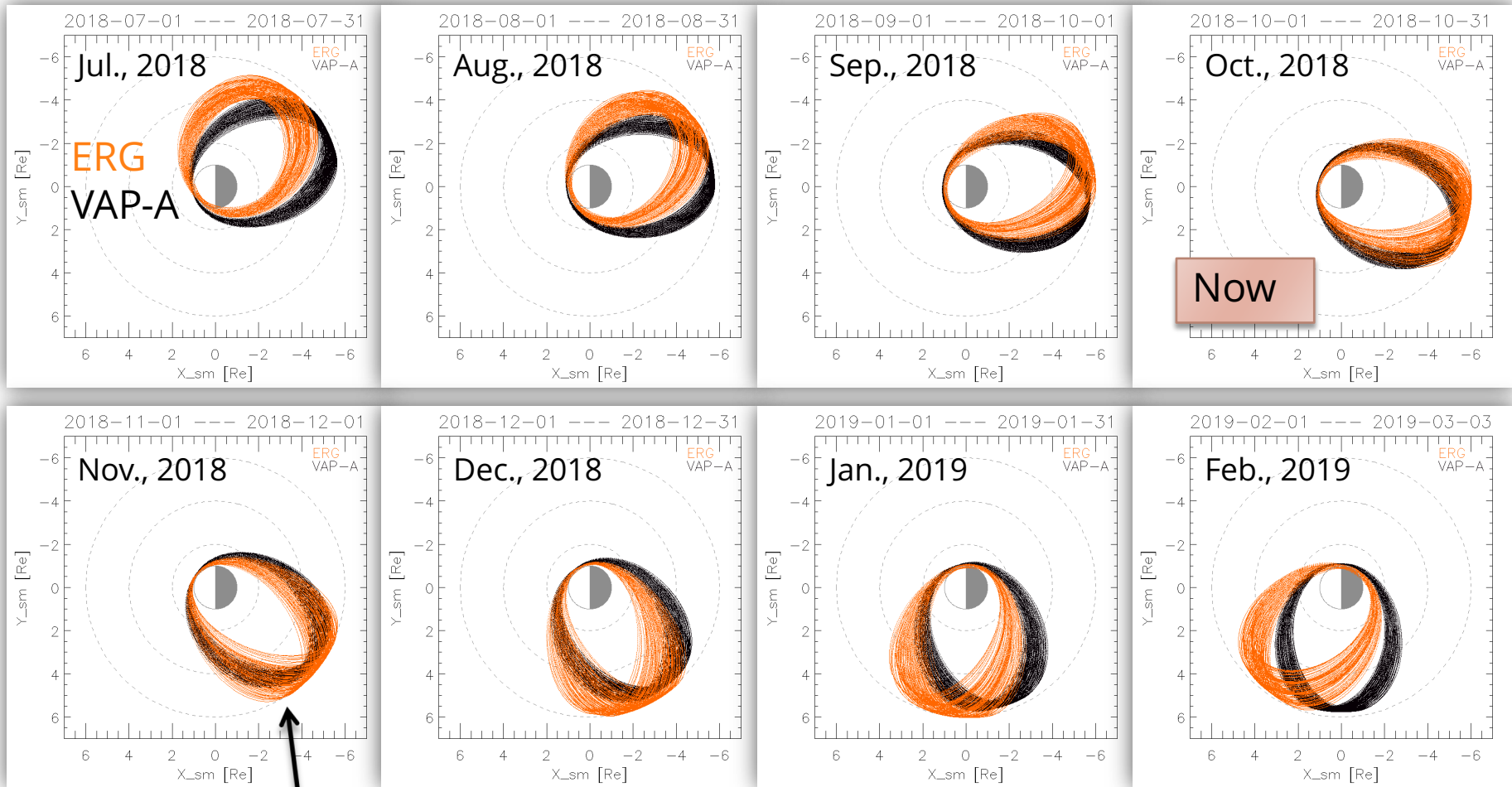
▶ Mar, 2017: **the special observation (requested as DT) for pulsating aurora study** (K. Hosokawa)

▶ May–Jun, 2017: **themisscan for Pi 2 study** (M. Teramoto)

▶ Aug, 2017: **themisscan for FLR study** (H. Kawano)



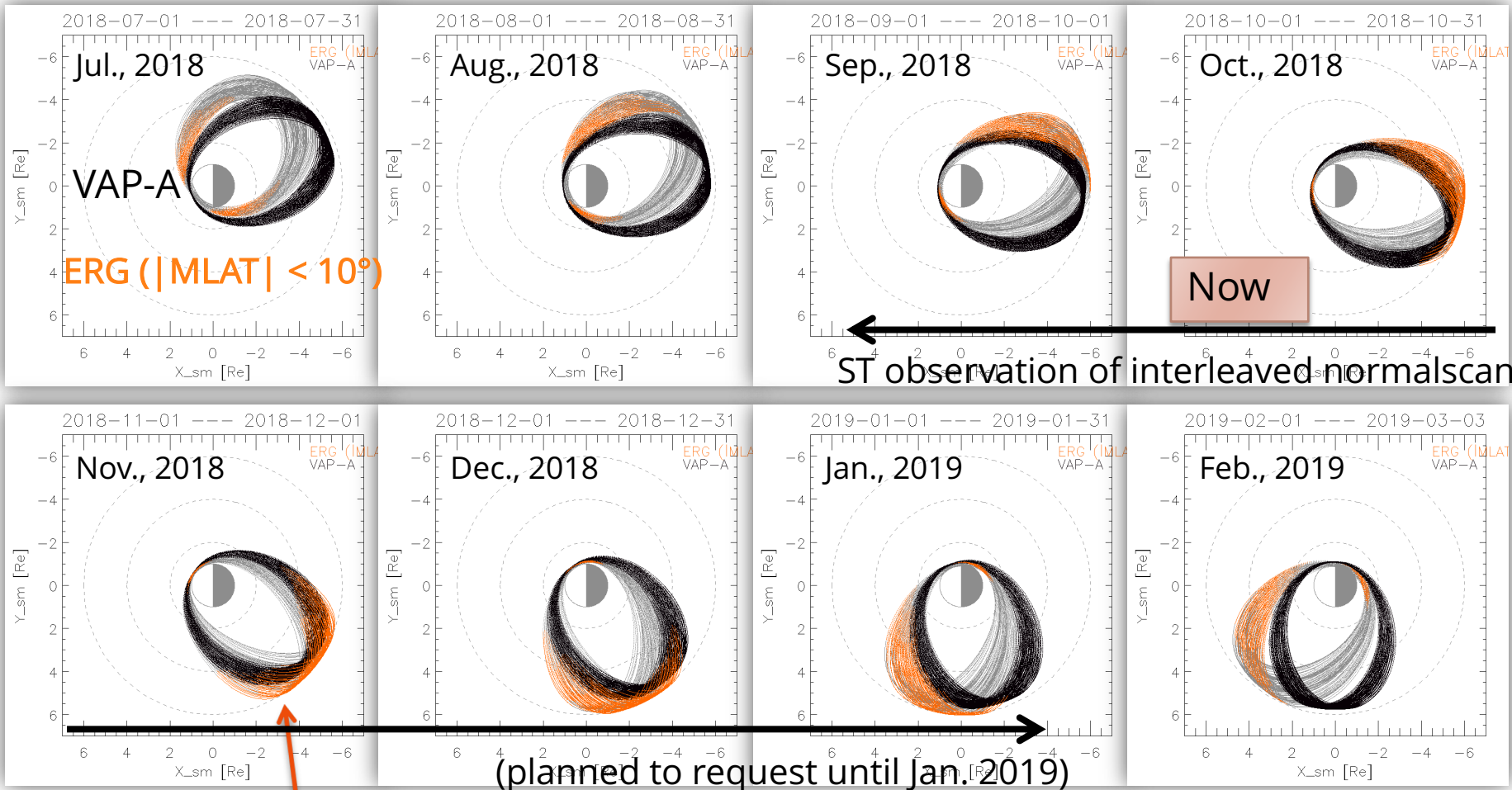
Arase-RBSP-SuperDARN conjunction during Fall-Winter of 2018/19 (now in season)



- ▶ Arase's apogee meridian overtakes RBSPs' on early November.



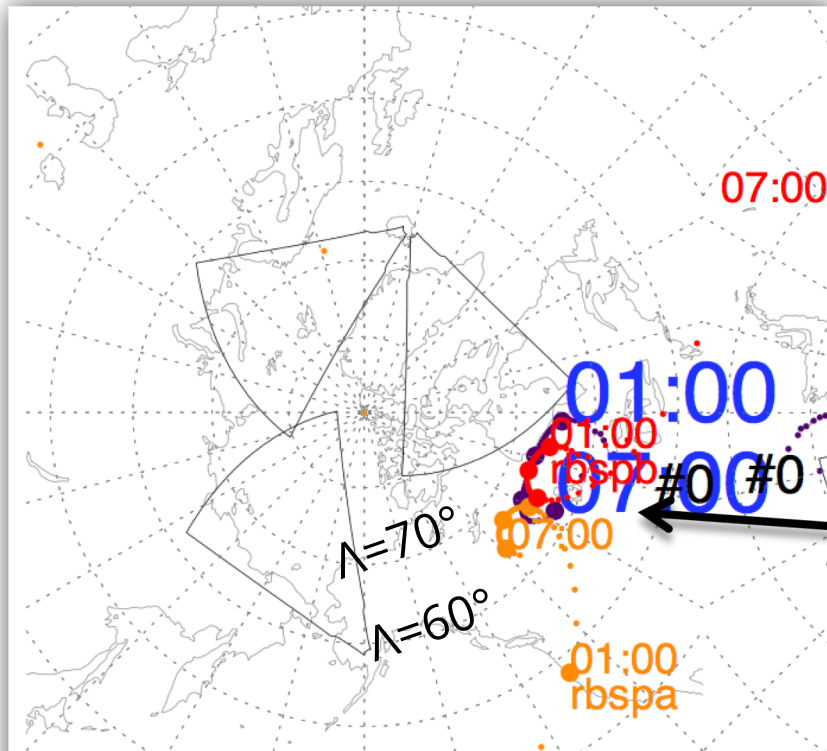
Arase-RBSP-SuperDARN conjunction during Fall-Winter of 2018/19 (now in season)



- ▶ Arase samples the equatorial region most efficiently during Nov.

An example of the Arase-RBSP-SD conjunctions

- ▶ Possibly the footprints of all the three satellites could be in the fields-of-view of SD radars.



The footprint trajectories of **Arase**, **RBSP-A**, **RBSP-B** during ~1–7 UT on November 20.

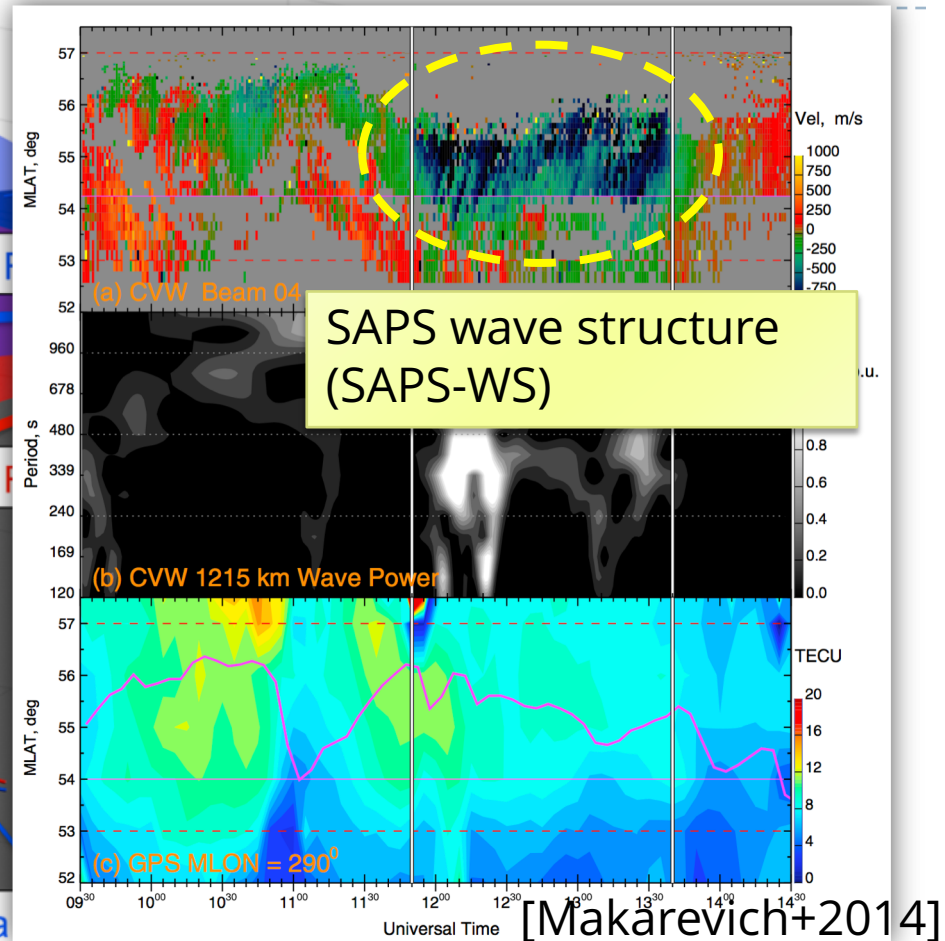
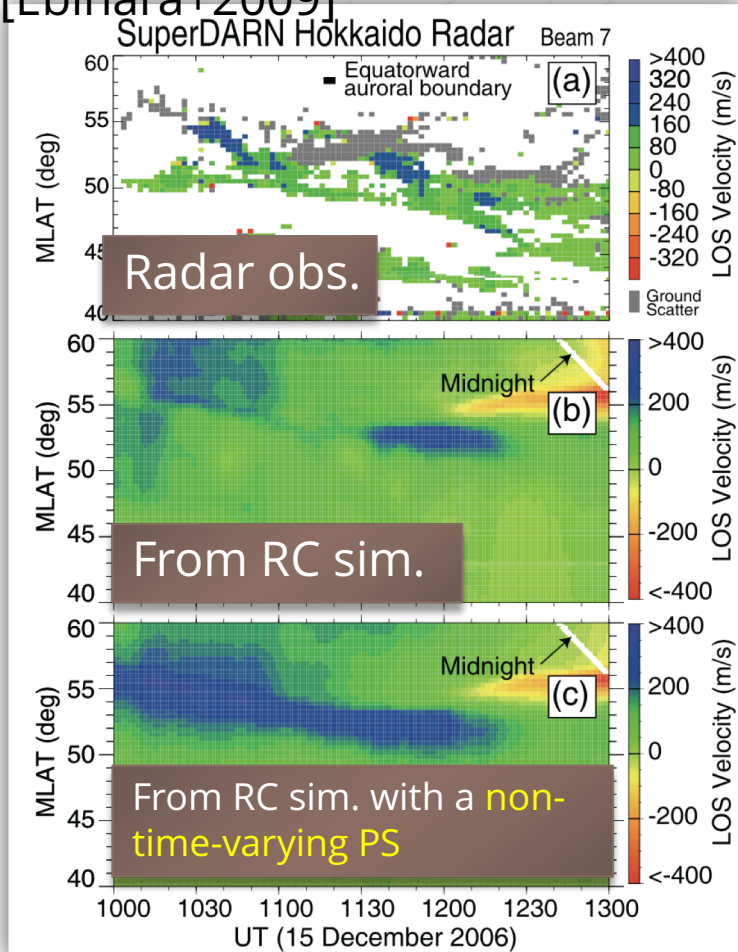
Conjunction list (N.hemis):
0: 20181120 23:34-07:39

We have agreed with the Arase project that the **particle instruments of Arase** will be operated in **3-D distribution function modes** during the requested ST periods.



Scientific target: Dynamical features of SAPS

[Ebihara+2009]



- ▶ Spatio-temporal evolution in various scales of SAPS would be an interesting subject to study, with a combination of multi-satellites and SuperDARN radars.



Summary

- ▶ **Close conjunction of Arase, RBSPs, and SuperDARN** are repeatedly realized at sub-auroral to mid-latitudes in the evening sector during the 2018/19 fall-winter season, providing a precious opportunity to study M-I coupled processes, such as SAPS, ring current, and etc.
- ▶ So far 2 papers using SuperDARN data have been accepted/published for the Arase special issue of GRL.

Now we accept a proposal for special observation request during Jan., 2019. Please feel free to consult with Hori or Japanese SD PIs (Nishitani-san, Nagatsuma-san, Yukimatu-san).

Campaign observation for 2018-2019 fall to winter season [\[edit\]](#)

Scheduled operations for the Arase-Van Allen Probes-SuperDARN conjunctions aiming at satellite-ground multipoint observations of SAPS

DD1:HH1 DD2:HH2 *schedule category [radars by which the special obs. is made] { Name of scan program }*

e.g., 22 UT, May 4 to 4 UT, May 5 --> **04:22 05:04**

September, 2018 [\[edit\]](#)

09/01 04:00-09/01 12:00 Special Time (ARASE) (see Note A) [HKW HOK ADW ADE KSR KOD CVW CVE FHW FHE BKS WAL PGR SAS] {interleaved nor
 09/03 02:00-09/03 12:00 Special Time (ARASE) (see Note A) [HKW HOK ADW ADE KSR KOD CVW CVE FHW FHE BKS WAL PGR SAS] {interleaved nor
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 09/23 04:00-09/23 14:00 Special Time (ARASE) (see Note A) [HKW HOK ADW ADE KSR KOD CVW CVE FHW FHE BKS WAL PGR SAS] {interleaved nor

October, 2018 [\[edit\]](#)

10/01 02:00-10/01 12:00 Special Time (ARASE) (see Note A) [HKW HOK ADW ADE KSR KOD CVW CVE FHW FHE BKS WAL PGR SAS] {interleaved nor

<https://ergsc.iisee.nagoya-u.ac.jp/mw/index.php/ErgGround/ErgSd>