

# Recent activities of Moshiri & Rikibetsu

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# Rikubetsu: NIES Bruker 120/5HR FTIR in operational since 2014



> NIES 120/5HR instrument & Bruker solar tracker were installed in 2013, and started measurements by “NDACC-mode” (with NDACC filters #1-6). The measurements are typically carried out once per week (as shown below).



> STEL & NIES agree to share the NDACC-mode spectra and to distribute the retrieval results to the research communities including NDACC-DB by STEL.

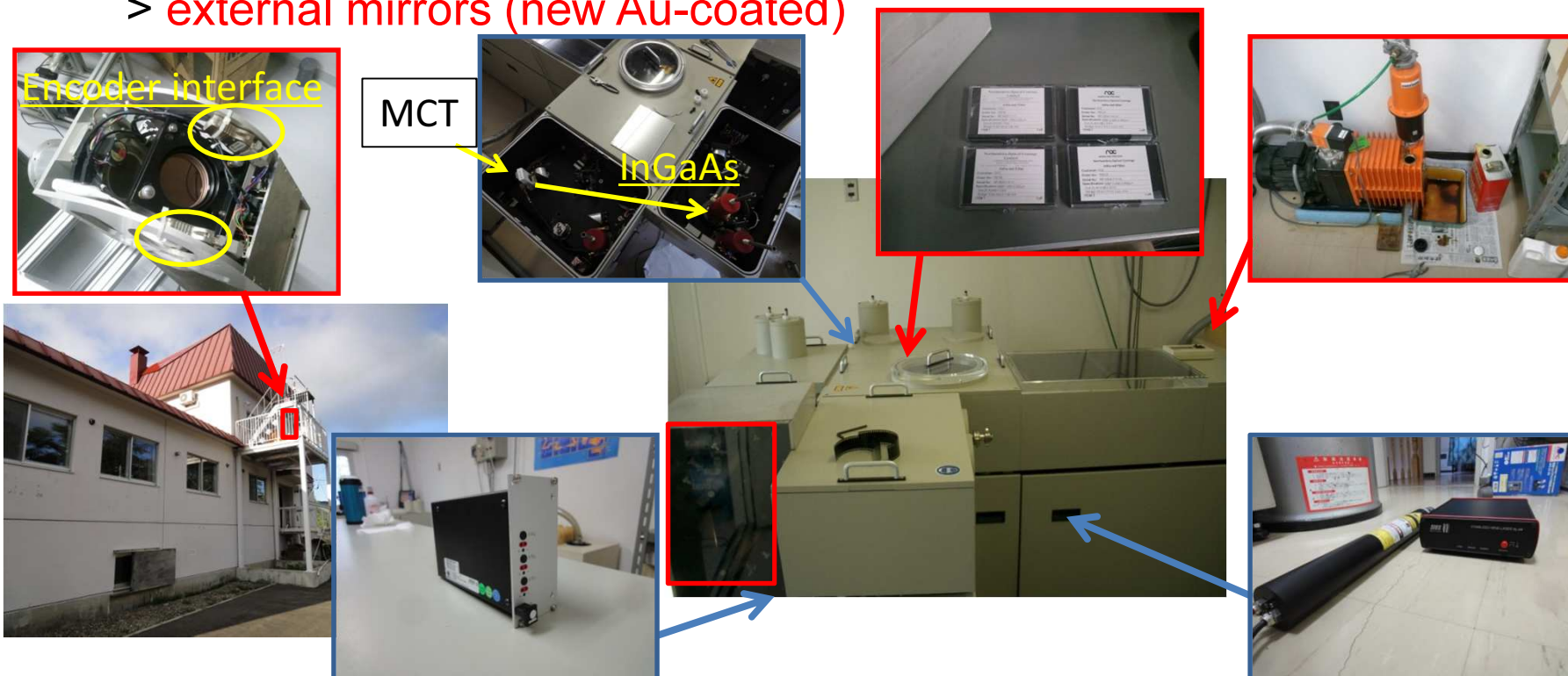
> As a first step, profile retrivals of  $O_3$ ,  $HCl$ ,  $HNO_3$  and  $HF$  using SFIT4 (v0.944) are now tested by STEL, and will be archived the data after validation.

| Year | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| 2014 | 4   | 3   | 2   | 3   | 2   | 3   | 2   | 2   | 1   | 4   | 3   | 3   | 32    |
| 2015 | 5   | 4   | 3   | 3   | 4   |     |     |     |     |     |     |     | 19    |

# Moshiri: many works for renewal in progress

We are repairing many items, and will restart the NDACC-mode measurements up to next September.

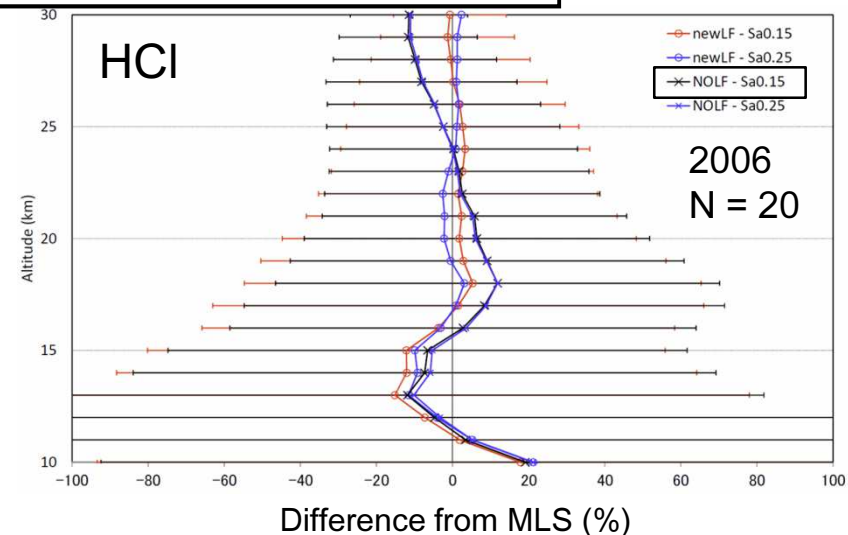
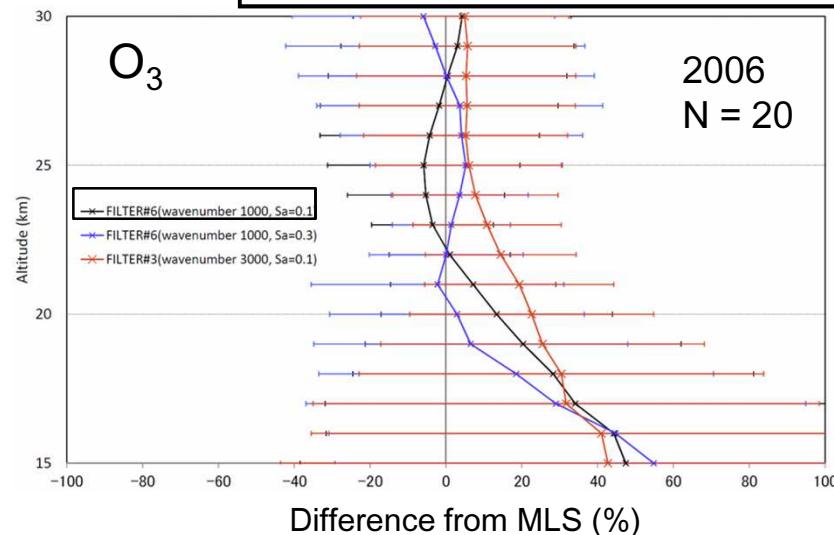
- > DC-supply units
- > He-Ne laser
- > detector-port configuration modified (MCT added, InGaAs moved)
- > solar tracker (encoder interfaces unstable since 2012)
- > vacuum system (broken in 2014)
- > NDACC filters (new #A (and #0?))
- > external mirrors (new Au-coated)



# Archived data (from 1995 to 2010):

- > All the measurements (Rik: 1010 days in 1995-2010, Mos: 1010 days in 1996-2008) with the STEL FTIRs were retrieved with SFIT2 (v3.92) and archived to NDACC-DB by Drs Y. Nagahama and Nakajima of NIES.
- > For validation of these data, comparisons with satellite measurements are in progress. In addition, improvement of the retrievals is on going by NIES (using WACCM V6 as a-priori data) and STEL (with SFIT4). After finishing either one, we will update the NDACC-DB files.

Comparison between Rikubetsu FTIR and MLS data  
(by Y. Nagahama of NIES)



# Rikubetsu: STEL 120M FTIR will be retired within a few years

- > The measurements have been suspended since June 2011 mainly caused by degrade of laser power miss alignment of the optics.
- > In this July, we will replace a laser and adjust an optics alignment with a Bruker Optics engineer.
- > After we make a simultaneous measurement with the NIES 120/5HR FTIR in 1-2 years in order to confirm the data quality and continuity, the instrument will be retired or moved to other places.

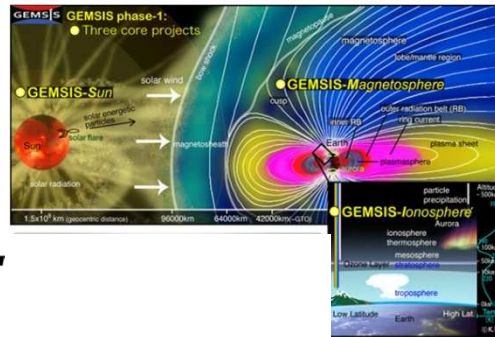
Now in Syowa station,  
Antarctica





# An important issue on our institute

- > STEL merges in October 2015 with the Hydrospheric Atmospheric Research Center (HyARC) and the Center for Chronological Research (CCR) of Nagoya University.

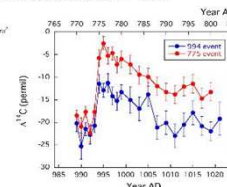


LETTER

Nature 2012

A signature of cosmic-ray increase in AD 774–775 from tree rings in Japan

From Miyake, S., Kikuchi, T., Kasai, H., Kimoto, M., Miyake, S., Nakai, H., Nakamura, T.



宇宙地球環境研究所  
(TBD)

Core research projects

- > Change of solar activity and its impact on climate
- > Aerosol and cloud formation processes
- > Plasma-Neutral atmosphere coupling processes
- > Space weather prediction

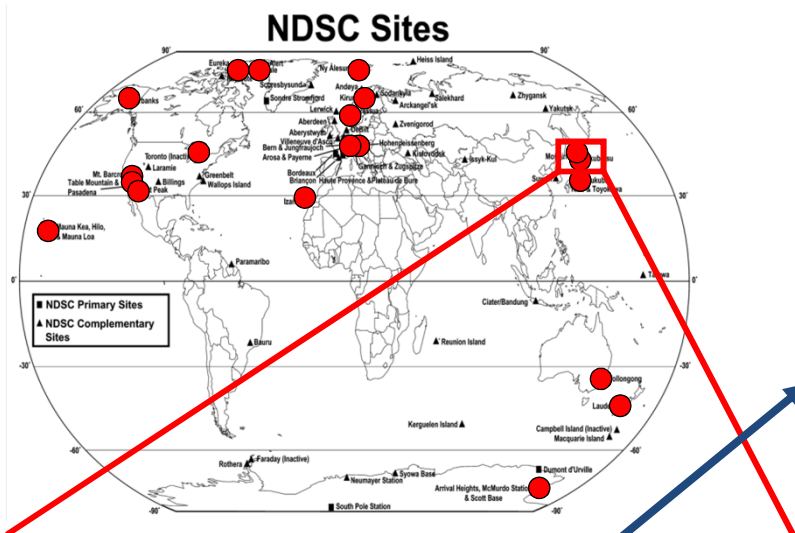
# Summary

- > Since 2014, the “NDACC-mode” measurements with the NIES Bruker 120/5HR are carried out at Rikubetsu typically every week.
- > Repairing the Moshiri FTIR (Bruker IFS120HR) system is in progress, and it will restart the NDACC-mode measurements in next September.
- > All the data taken at Rikubetsu and Moshiri until 2010 are retrieved with SFIT2 and archived in NDACC-DB by the NIES colleagues. Works for validation and improvement of retrieval are on going by NIES and STEL.
- > The STEL Rikubetsu FTIR (Bruker IFS120M) will be retired (or moved to others) after the data comparisons in Rikubetsu are finished.
- > STEL merges in October 2015 with HyARC and CCR of Nagoya University, but after that, the new institute is responsible for the present activities and hopes to keep in touch with the NDACC activities.

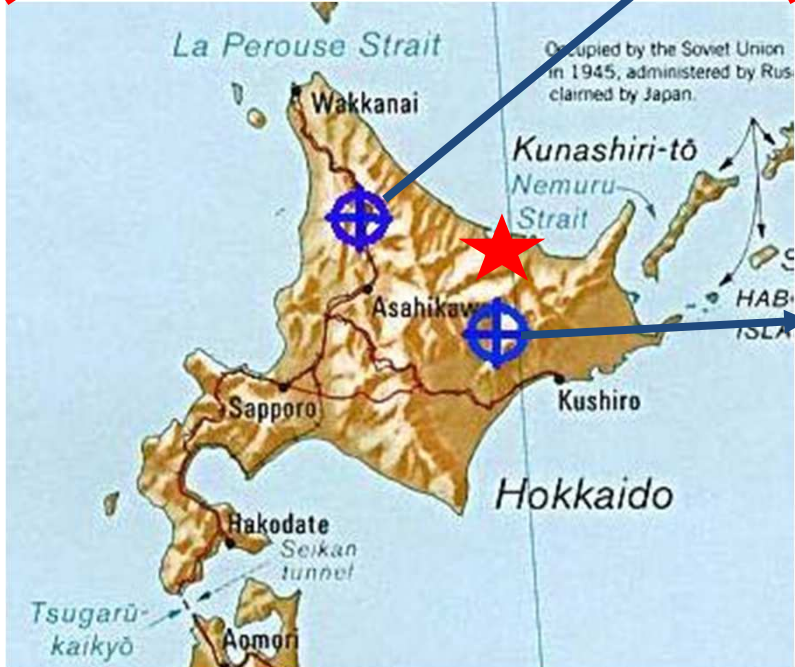




# Location



Moshiri (44.4N, 142.3E)



Rikubetsu (43.5N, 143.8E)

# FTIR at Moshiri & Rikubetsu

Moshiri

Bruker IFS 120HR

(Max resolution:  $0.0013\text{ cm}^{-1}$ )

Operational April 1996



Rikubetsu

Bruker IFS 120M

(Max resolution:  $0.0035\text{ cm}^{-1}$ )

Operational May 1995





# Number of measurements at Moshiri

[illegible]