

# ISSUE # 18 JUN. 2011

## CONTENTS

### NEWS

Report : the 3rd GOSAT RA PI Meeting	01
Report : IWGGMS-7	03
"IBUKI"'s CO <sub>2</sub> Concentration Data Debut on "Geo-Cosmos" at National Museum of Emerging Science and Innovation in Tokyo	04

### IMAGES OF THE MONTH

Plume from Puyehue Volcano, Chile	05
-----------------------------------	----

### INTERVIEW

"IBUKI"'s PI Interview - Professor Paul Palmer	06
--	----

### DATA PRODUCT UPDATE

Data Processing Status Update from GOSAT Project Office On Version Upgrade of Level 1 Products and Accompanying Upgrades of the Higher Level Products	08
---	----

### PUBLISHED PAPERS

09

### ANNOUNCEMENTS

09



Independent Administrative Institution  
National Institute for Environmental Studies (NIES)  
A newsletter on the Greenhouse gases Observing SATellite  
(GOSAT, "IBUKI" ) project from the NIES GOSAT Project Office.  
<http://www.gosat.nies.go.jp/>



Group photo of the 3rd GOSAT RA PI Meeting taken at the John McIntyre Conference Centre of the University of Edinburgh, UK.

### NEWS

## Report : The 3rd GOSAT RA PI Meeting

Chairperson, GOSAT RA Selection and Evaluation Committee (RA Committee)

Professor Haruhisa Shimoda of Research Institute of Science and Technology at Tokai University

"IBUKI"'s data products are used not only by the GOSAT Project, but also the researchers around the world. A meeting to share the research outcomes among such researchers was held in Edinburgh, Scotland, UK. This is a report of the meeting by the GOSAT Research Announcement Selection and Evaluation Committee Chairperson Haruhisa Shimoda. *(article on next page)*





1. John McIntyre Conference Centre of the University of Edinburgh 2. Participants during the meeting 3. Dr. Christian Frankenberg of the Jet Propulsion Laboratory during his presentation 4. At a working group discussion 5. Sergey Oshchepkov of NIES GOSAT Project Office during his presentation

🌱🌱🌱 This meeting was held at the University of Edinburgh in Edinburgh, UK, following the 7th International Workshop on Greenhouse Gas Measurements from Space (see a report on P.3) held at the same university. The venue was the John McIntyre Conference Centre, located in the Pollock Halls of Residence of the University of Edinburgh (Photo 1). The participants were 54 including the Principal Investigators (PI) and Co Investigators (Co-I), and 82 in total, including the staff from the National Institute for Environmental Studies (NIES), the Japan Aerospace Exploration Agency (JAXA) and the guests from the National Aeronautics and Space Administration (NASA).

The meeting started with a plenary session at 9 a.m. on the first day, followed by sessions on calibration, validation, and algorithms. The second day was for the sessions on modeling and application, and ended with a closing session. On the second day after the application session, the participants separated into different working groups and engaged in one and half hour discussions.

The plenary started with the greeting remarks from Deputy Director Midori Sasaki of Research and Information Office at the Ministry of the Environment, Japan,

and the local host of this year's meeting, Professor Paul Palmer of the University of Edinburgh. They were followed by the reports on current status of the project: "Report on recent calibration status of GOSAT" (by Kei Shiomi of JAXA), "Reports on recent processing and validation status of the GOSAT data by NIES" (Tatsuya Yokota of NIES) and "Summary of Action Items from the 2nd RA PI Meeting and brief introduction to the GUIG" (Hiroshi Watanabe of NIES).

Two researchers gave presentations in the calibration session, and what was pointed out was an issue with the solar spectrum which is used for GOSAT standard products generation. In the subsequent validation session, eight people gave presentations. Many of these validation studies use the ground-based high-resolution FTSS, and their results were consistent with the results from NIES.

The most active session of all was the algorithm session with eighteen presentations. Some of these presentations were notable. One presentation suggested that the errors with the surface pressure values acquired by Oxygen A-Band are causing almost half of the bias in current Level 2 standard products. It was also suggested that another biggest bias

factor is that the vertical distribution of aerosols in the troposphere interferes with the accuracy of carbon dioxide (CO<sub>2</sub>) and methane retrieval.

Another noteworthy presentation was that the chlorophyll fluorescence emitted from the ground vegetation was observed in the Band 1 of GOSAT spectra. A global map of Gross Photosynthetic Production (GPP) was generated from the fluorescence data.

In the following modeling session, seven people gave presentations. It was indicated that the use of GOSAT data products has contributed largely to the better estimation of CO<sub>2</sub> flux. It was also presented that applying the data assimilation is effective in decreasing the bias to 1 ppm and errors to 2.7 ppm.


The last session was the application session with 8 presentations. Many of their targets were the regional greenhouse gas trends. It was rather regretful that there was no presentation on the Cloud and Aerosol Imager related studies.

In the closing session, it was suggested that we should organize a special issue of journal on GOSAT. We are going to take this suggestion into consideration and would like to start looking for a collaborating journal.



## NEWS Report : IWGGMS-7

- Yukio Yoshida,  
Researcher, Satellite Remote Sensing Research Section,  
Center for Global Environmental Research at NIES

 The Seventh International Workshop on Greenhouse Gas Measurement from Space (IWGGMS-7) was held from May 16 to May 18, 2011. The workshop was first organized in April 2004 in Tokyo, Japan, and has been held almost annually ever since. When it started it was also around the time when the research papers on carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>) observation results from satellite sensors, such as AIRS<sup>\*1</sup> and SCIAMACHY<sup>\*2</sup>, started to appear in journals, and the development of satellites for greenhouse gas measurement purpose, such as GOSAT and OCO<sup>\*3</sup>, also started to be fully in progress.


Since then, GOSAT was launched in 2009, and it was followed by the expansion of TCCON<sup>\*4</sup>, the network of ground-based high-resolution Fourier Transform Spectrometer observations with a purpose to validate outcomes of these satellite observations. The greenhouse gas measurement using airplanes (CONTRAIL<sup>\*5</sup>,

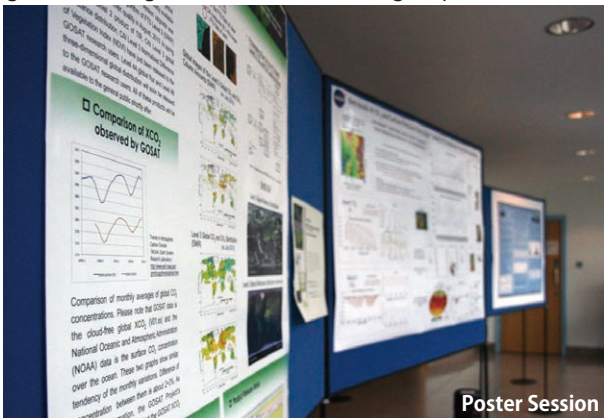
CARIBIC<sup>\*6</sup>, HIPPO<sup>\*7</sup>) also made its progress. As such, while the carbon cycle related observation activities are growing, the number of participants to IWGGMS is also growing bigger each time. This year, 150 researchers attended the workshop and made about 100 oral and poster presentations. It could be also because the venue for this year's IWGGMS-7 was the University of Edinburgh in United Kingdom, the school with a long history of carbon cycle studies, as this university is where Joseph Black who discovered CO<sub>2</sub> in 1750s was studying.

The presentations made on the first day were on the observation results from ongoing satellite missions as well as on calibration and validation studies of those results. There were a large number of presentations on the results of GOSAT data retrieval and their calibration/validation, along with the results of observations by IASI<sup>\*8</sup>, ACE<sup>\*9</sup>, TES<sup>\*10</sup>, as well as long-term observations of CO<sub>2</sub> and CH<sub>4</sub> by AIRS and SCIAMACHY. There were presentations on comparisons among the retrieval algorithms of researchers worldwide who work on GOSAT spectral data to retrieve greenhouse gas concentrations as well. A study on the vegetation activities by isolating the fluorescence produced by chlorophyll detected in the oxygen a band (0.76mm band) was presented as new GOSAT data application study. It is a very interesting point of view that GOSAT approaches the carbon cycle study from an aspect other than direct greenhouse gas measurement.

The presentations made on the second day were mainly on retrieval algorithms and carbon balance studies using satellite data. It is expected that the satellites acquire data over the areas with no existing observational data, and thus contribute to making more accurate estimations on where and how much greenhouse gases are emitted and absorbed. This carbon balance study is also one of the goals for the GOSAT Project. Topics presented this day cover the study on the global greenhouse gas flux inversion using SCIAMACHY, GOSAT, and TES data, and a more local studies such as, an assessment of the amount of CO<sub>2</sub> emission in metropolitan areas and power plants, by analyzing the gap of the CO<sub>2</sub> concentration between those largest sources of anthropogenic CO<sub>2</sub> emission and the neighboring areas.

The last day was dedicated for oral presentations on future satellite missions (the related posters were presented on the second day). The presentations included a report from the project in the process of satellite launch in a few years, and another report in development of a sensor with the latest technology. There was a presentation on a project that aims to focus on the carbon flux in the tropics where there is a great amount of uncertainty. A plan to monitor daily variation of CO<sub>2</sub> at a certain point using a static satellite was another topic presented this day.

The role of satellite in the carbon cycle studies is growing more and more important. It is expected that more researchers make progress with their research using the GOSAT data. The next workshop is scheduled in May 2012 in the United States. 



Poster Session



Meeting

\*1 **Atmospheric InfraRed Sounder (AIRS)** is a high spectral resolution spectrometer that measures atmospheric temperature and humidity, and land and sea surface temperature. It is installed on Aqua satellite, and launched in May 2002. The instrument is designed to support climate research and improve weather forecasting.

\*2 **SCanning Imaging Absorption spectroMeter for Atmospheric Cartography (SCIAMACHY)** is a passive remote sensing spectrometer observing backscattered, reflected, transmitted or emitted radiation from the atmosphere and Earth's surface. The instrument flies on board European Space Agency's ENVISAT satellite, which was launched on March 1, 2002.

\*3 **Orbiting Carbon Observatory (OCO)** is one of NASA's Earth System Science Pathfinder Project (ESSP) missions, designed to make global measurements of atmospheric CO<sub>2</sub> from an Earth orbiting satellite. Unfortunately, the launch of OCO satellite failed on February 24, 2009. However, a replacement model OCO-2 is being developed by NASA and is scheduled to be launched in February 2013.

\*4 **Total Carbon Column Observing Network (TCCON)** is a network of the ground-based high-resolution FTs observations. Currently, its observations are carried out in more than ten locations worldwide. TCCON's column-averaged volume mixing ratios of greenhouse gases are used for validating greenhouse gases observation by satellites and other carbon cycle studies.

\*5 **Comprehensive Observation Network for TRace gases by AirLiner (CONTRAIL)** is a project to measure CO<sub>2</sub> from passenger aircrafts while they are operating in the air. An instrument to collect air samples and an instrument to measure CO<sub>2</sub> concentration in the atmosphere continuously are installed in the cargo room of JAL aircrafts.

\*6 **Civil Aircraft for the Regular Investigation of the atmosphere Based on an Instrument Container (CARIBIC)** is a project to measure greenhouse gases, reactive gases, and aerosols using the Lufthansa aircrafts.

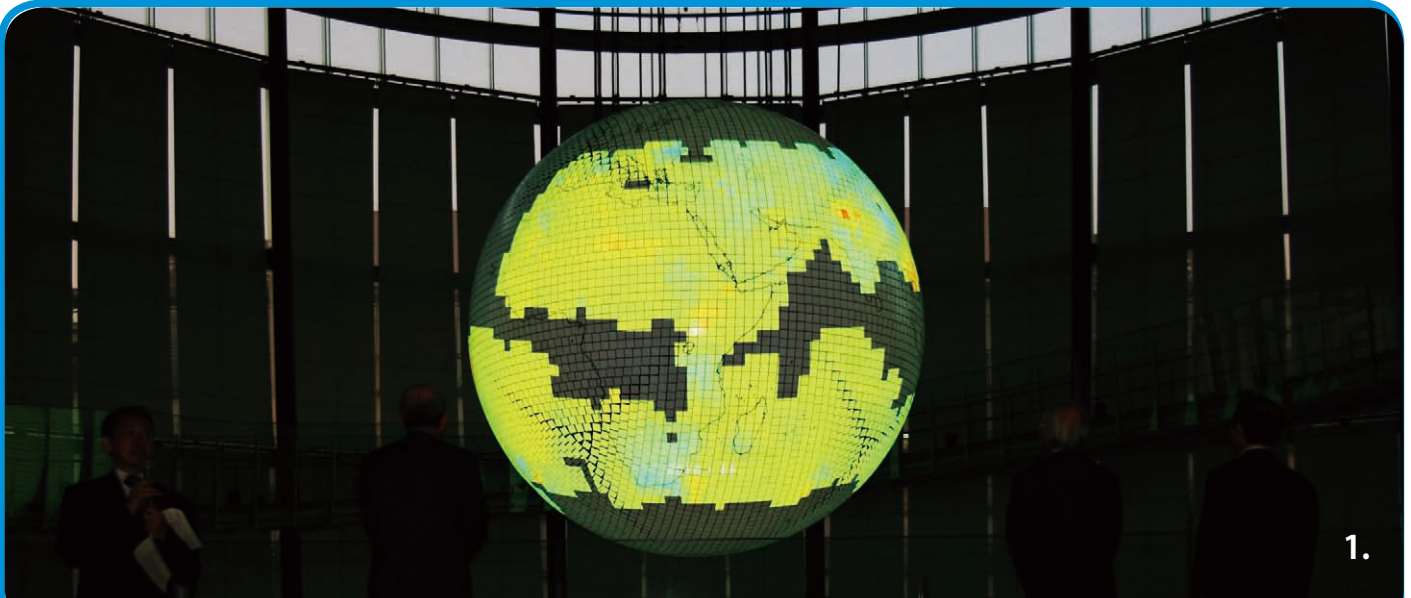
\*7 **The Hiaper Pole-to-Pole Observations (HIPPO)** is a project to collect air samples of greenhouse gases including CO<sub>2</sub> at different heights in the atmosphere approximately pole-to-pole using Hiaper, an aircraft developed specifically for environmental research.

\*8 **Infrared Atmospheric Sounding Interferometer (IASI)** is an instrument unit of MetOp, a series of European meteorological satellites. IASI measures infrared radiation emitted from the surface of the Earth to derive data on humidity and temperature profiles in the troposphere and lower stratosphere, as well as some of the chemical components playing a key role for climate monitoring and atmospheric chemistry. The first model was launched on METOP-A satellite in October 2006.

\*9 **Atmospheric Chemistry Experiment (ACE)** is an instrument onboard the Canadian satellite SCISAT-1 launched in August 2003. Its main purpose is to measure temperature, trace gases, cirrus clouds, and vertical profiles of aerosols.

\*10 **Tropospheric Emission Spectrometer (TES)** is one of the sensors onboard AURA, NASA's earth observing satellite, launched on July 15, 2004. TES observes the distribution of tropospheric ozone and of carbon monoxide, ozone, water vapor and CH<sub>4</sub> in the troposphere





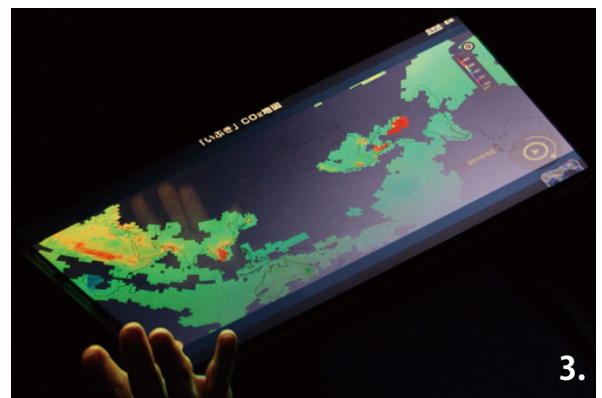
1.

## NEWS "IBUKI"'s CO<sub>2</sub> Concentration Data Debut on "Geo-Cosmos" at National Museum of Emerging Science and Innovation in Tokyo

- Yuki Tanaka, Specialist, NIES GOSAT Project Office



2.



3.



4.

🌍🌍🌍 "IBUKI"'s data will be exhibited at the National Museum of Emerging Science and Innovation (Miraikan) in Odaiba, Tokyo as a part of its "TSUNAGARI" Project.

"TSUNAGARI" (meant "link", "connection" etc. in Japanese) Project is Miraikan's new project dedicated to understanding the Earth by using 3 tools, "Geo-Cosmos," "Geo-Scope," and "Geo-Palette." Geo-Cosmos, a 6-meter globe-like organic LED display, will exhibit the seasonal variation of carbon dioxide concentration on the entire globe observed by "IBUKI." "IBUKI"'s data can also be found on Geo-Scope, interactive touch-panel boards for viewing the earth observation data collected from all around the world.

"TSUNAGARI" Project started as Miraikan reopened on June 11, 2011, after being closed due to the earthquake on March 11, 2011.



"TSUNAGARI" project webpage URL:

<http://www.miraikan.jst.go.jp/en/sp/tsunagari/>

The National Museum of Emerging Science and Innovation (Miraikan) URL:

<http://www.miraikan.jst.go.jp/en/>

Photo 1. "CO<sub>2</sub> Map by 'IBUKI'" displayed on Miraikan's symbol exhibition, a globe-like organic LED display, Geo-Cosmos.

Photo 2. Chief Executive Director Mouri Mamoru\*1 of Miraikan on June 3 at the private viewing. The content displayed on Geo-Cosmos is "The Earth" (Data provided by: University of Wisconsin Space Science and Engineering Center).

Photo 3. "CO<sub>2</sub> Map by 'IBUKI'" displayed on one of Miraikan's interactive boards, Geo-Scope.

Photo 4. On June 3 at Miraikan. GOSAT Project members are greeted by Chief Executive Director Mamoru Mouri of Miraikan.

\*1 A former astronaut who flew space on two Space Shuttle missions, in 1992 and 2000. He was appointed to the Chief Executive Director for Miraikan in October, 2000.



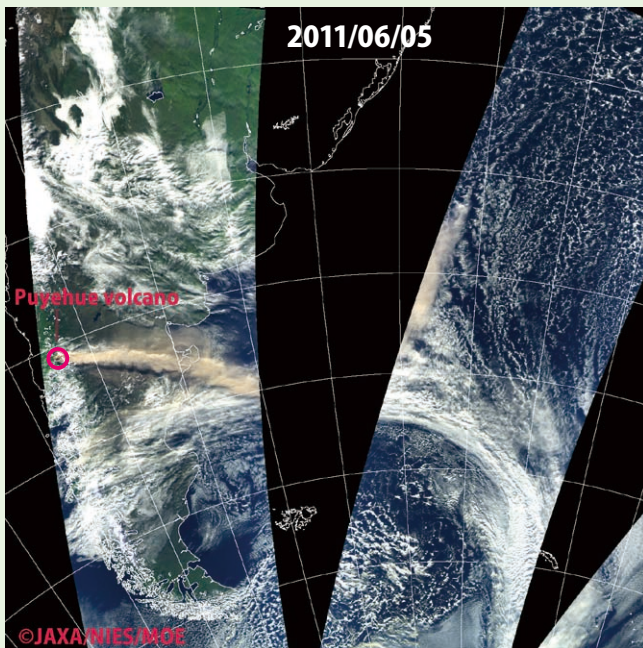
## IMAGES OF THE MONTH

**PLUME FROM PUYEHUE VOLCANO, CHILE** - Nobuyuki Kikuchi, Specialist, NIES GOSAT Project Office

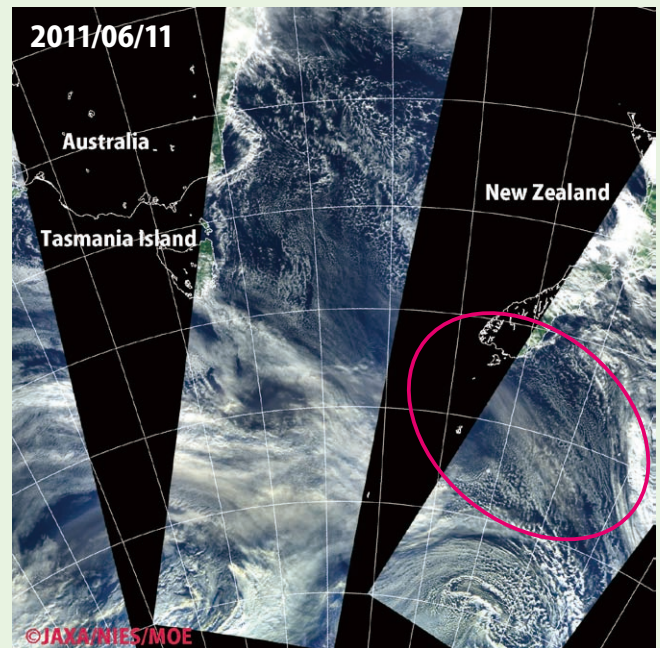
🌐🌐🌐 The Puyehue volcano erupted in Chile on June 4, 2011. In the image taken by "IBUKI" on June 5, 2011, the plume drifts over southern Argentina and is reaching the Atlantic Ocean.

By June 11, 2011, the volcanic plume reaches New Zealand after drifting over the ocean south of Australia.

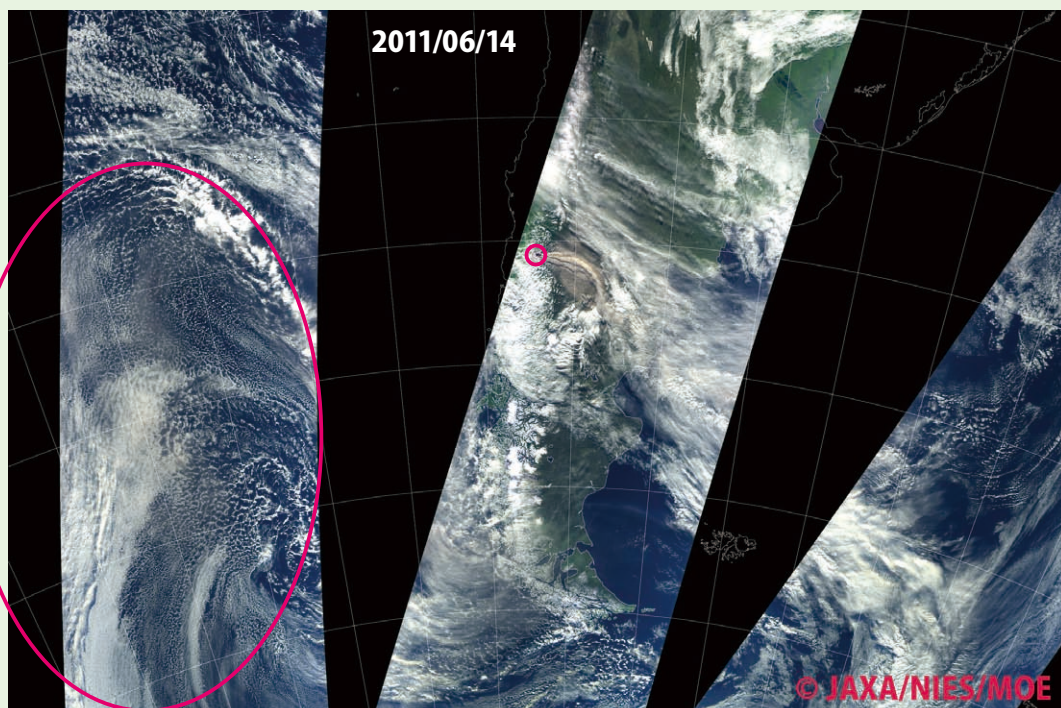
In the image acquired on June 14, 2011, Puyehue volcano is still in eruption and the spewed plume is drifting southeastward. Over the Pacific Ocean west of the volcano, there is an area where clouds are blurry light brown because of the plume that made its way around the world. 🌐🌐🌐



An image from "IBUKI" when the satellite passed over South America on June 5, 2011 at (from right) 13:30, 15:09, and 16:47 (UTC). The red circle indicates the location of the Puyehue volcano. The volcanic plume (light brown) is pushed by westerly winds and drifting to the Atlantic Ocean.



An image from "IBUKI" when the satellite passed near Australia on June 11, 2011 at (from right) 00:25, 02:03, and 03:41 (UTC). The volcanic plume reaches New Zealand after drifting over the ocean south of Australia.



The Puyehue volcano on June 14. There is a plume that has made its way around the world drifting over the Pacific Ocean west of the volcano. "IBUKI" passed over the area at 15:09, 16:47, 18:25 (UTC).



## INTERVIEW

## A Series : "IBUKI"'s PI Interviews

No.6

**PROFESSOR  
PAUL PALMER**

School of GeoSciences, University of Edinburgh, UK

During the 7th International Workshop on Greenhouse Gases Measurement from Space reported on page 3, the NIES GOSAT PROJECT NEWSLETTER interviewed the host of this workshop, Professor Paul Palmer of School of GeoSciences at the University of Edinburgh. Professor Palmer is the principal investigator (PI) for the research titled "GOSAT XCH<sub>4</sub> and XCO<sub>2</sub> observations: Validation and model interpretation" selected in the GOSAT research announcement (GOSAT RA). (Interviewer : NIES GOSAT Project Tatsuya Yokota)

**Yokota (Y):** Ok, I would like to start by asking you about your personal history of research works, including your education and why you chose this research field.

**Palmer (P):** I studied physics at Bristol University for my undergraduate degree, and physics at Oxford University for my doctorate.

**Y:** What was the subject of your doctorate study?

**P:** It was on radio occultation measurements of the Earth's atmosphere using the Global Positioning System (GPS) satellite and a receiver in low-Earth orbit. The receiver measured essentially the time it took for an L-band signal to be received from the GPS transmitter. As the receiver passes behind the atmosphere, relative to a transmitter, refraction of the signal along the atmospheric path led to a delay in the received signal, which provided very accurate information about atmospheric temperature and humidity. These kinds of data are now used by the numerical weather prediction community, so that's very satisfying.

Then, I decided that I wanted to explore other things that satellites could do in terms of the Earth's atmosphere. So, I went to Harvard University and spent six years working with Professor Daniel Jacob<sup>\*1</sup>. That enabled me to work on the whole range of different subjects. Whilst at Harvard I spent a lot of time helping to develop and interpret satellite observations of formaldehyde to understand the

emissions of isoprene<sup>\*2</sup>, a biogenic hydrocarbon emitted by broadleaf trees that also happens to be a precursor to tropospheric ozone. Towards the end of my stay, I worked on atmospheric CO<sub>2</sub>.

**Y:** You worked on many different subjects. What would you say your interest is?

**P:** My interest? My interests are pretty broad. I think my specialty is to try to connect different disciplines together. So, for instance, my recent work I did with Anthony Bloom in my group connected methane (CH<sub>4</sub>) with very precise measurements of the changes in the Earth's gravitational field. These changes can be from buildings, or from the ocean or lakes. We know that the biggest single source of CH<sub>4</sub> is from wetlands, which is typically seasonal. In some places around the world, the emissions of CH<sub>4</sub> from wetlands are determined by the variability of water. What we managed to do was connect the change in gravity throughout the year with changes in SCIAMACHY CH<sub>4</sub> columns to infer changes in emissions of CH<sub>4</sub> from wetlands. Connecting the dots is one thing I like to do. I think cutting edge science in our field is progressively being driven at the boundaries between traditional disciplines, and this is where the action will be for the foreseeable future.

I came to Edinburgh in 2006, and have been here ever

<sup>\*1</sup> Professor Daniel Jacob is Vasco McCoy Family Professor of Atmospheric Chemistry and Environmental Engineering at Harvard University.

<sup>\*2</sup> Isoprene is one of the biogenic hydrocarbons produced and emitted mainly from trees.



since. I lead a very energetic and lively bunch of researchers. We work on subjects that interest me and interest them, and one of the strands of research I work on is the interpretation of GOSAT CH<sub>4</sub> and CO<sub>2</sub>. One of the science challenges that motivate me is locating and quantifying emission and uptake of CO<sub>2</sub>. This has got to be one of the biggest outstanding problems of the 21st century. Where is the missing uptake that is necessary to balance the CO<sub>2</sub> budget? I think that is a really nice problem we can solve either with GOSAT or another instrument.



**Y:** You are a member of the OCO<sup>\*3</sup> science team. How did you meet Shamil Maksyutov's modeling group of our institute?

**P:** I met Shamil quite a few years ago now. I think we met either in the OCO science team meeting or during a previous IWGGMS. Shamil and I share many common research interests. As you know, we shared a British Council grant. It helped to establish and cement relationship between the Edinburgh, Leicester and NIES groups working on GOSAT data. I think this relationship remains really important and very useful. For instance, it helped one of my students, Anthony Bloom, to work with Shamil during one summer with a Japan Society for the Promotion of Science fellowship. I know Anthony really enjoyed that experience. I look forward to continuing my relationship with NIES.

**Y:** I remember your group member Liang Feng also visited our institute, and from our institute, Tomohiro Oda and Yuji Koyama visited your group at Edinburgh.

**P:** That's right. If we can continue this exchange, that would be great because I think that both parties got a lot out from that connection.

**Y:** What is your feeling about the present GOSAT status?

**P:** I am pleasantly surprised.

**Y:** Really?

**P:** It is a difficult job to measure surface signatures of CO<sub>2</sub>. It is a difficult technical challenge. You are talking about very small

changes in a CO<sub>2</sub> column. And, if you get that wrong and all the models get it wrong, then we can completely misattribute what the satellite is telling us. However, the results Liang Feng has got from GOSAT are exciting. Most of all, I am impressed by the fact that it has taken you only two and half years.

**Y:** Thank you.

**P:** Absolutely.

**Y:** What is your expectation, first for the current GOSAT, and then for future GOSAT?

**P:** What we have done in Edinburgh and what other colleagues have shown today point to the fact that GOSAT is consistent with surface data. It is remarkable. Perhaps, it is not a huge science splash, but it is a really important step towards gaining confidence in using satellite data to quantify CO<sub>2</sub> fluxes. I think GOSAT has done a very good job with that.

**Y:** How about the GOSAT follow-on?

**P:** I don't know much about it. How are you going to improve upon GOSAT? Better signal to noise? Better spatial resolution?

**Y:** We are now talking about the possibility for the next GOSAT, including specifications and detailed objectives. So, we have not yet decided GOSAT follow-on. There are OCO-2, CarbonSat<sup>\*4</sup>, and other satellites. Among them, we have to identify what will be important in the world several years later.

**P:** I am going to outline a new instrument concept tomorrow. Instead of global coverage, this mission will focus on a region. Broadly speaking, there are two regions with big uncertainties in the CO<sub>2</sub> cycle: the tropics and polar-regions, where we generally have the least number of observations. The proposed mission will spend all this time looking at the tropics. I think that is the key thing.

**Y:** It is difficult and important.

**P:** If it weren't difficult, someone would have already done it, right? Difficult also means a challenge and for me that also makes it very exciting. And addressing challenges is often when new science gets done.

**Y:** This will be my final question. Do you have some comment or recommendation for the GOSAT Project?

**P:** I think they have done a good job. I really enjoyed working with the GOSAT Project team. I think the communications with the GOSAT Project has been extremely good. You were very willing to move your meeting to Edinburgh to make sure that as many people as possible could attend your meeting.

**Y:** Thank you very much for taking your valuable time for our interview today.



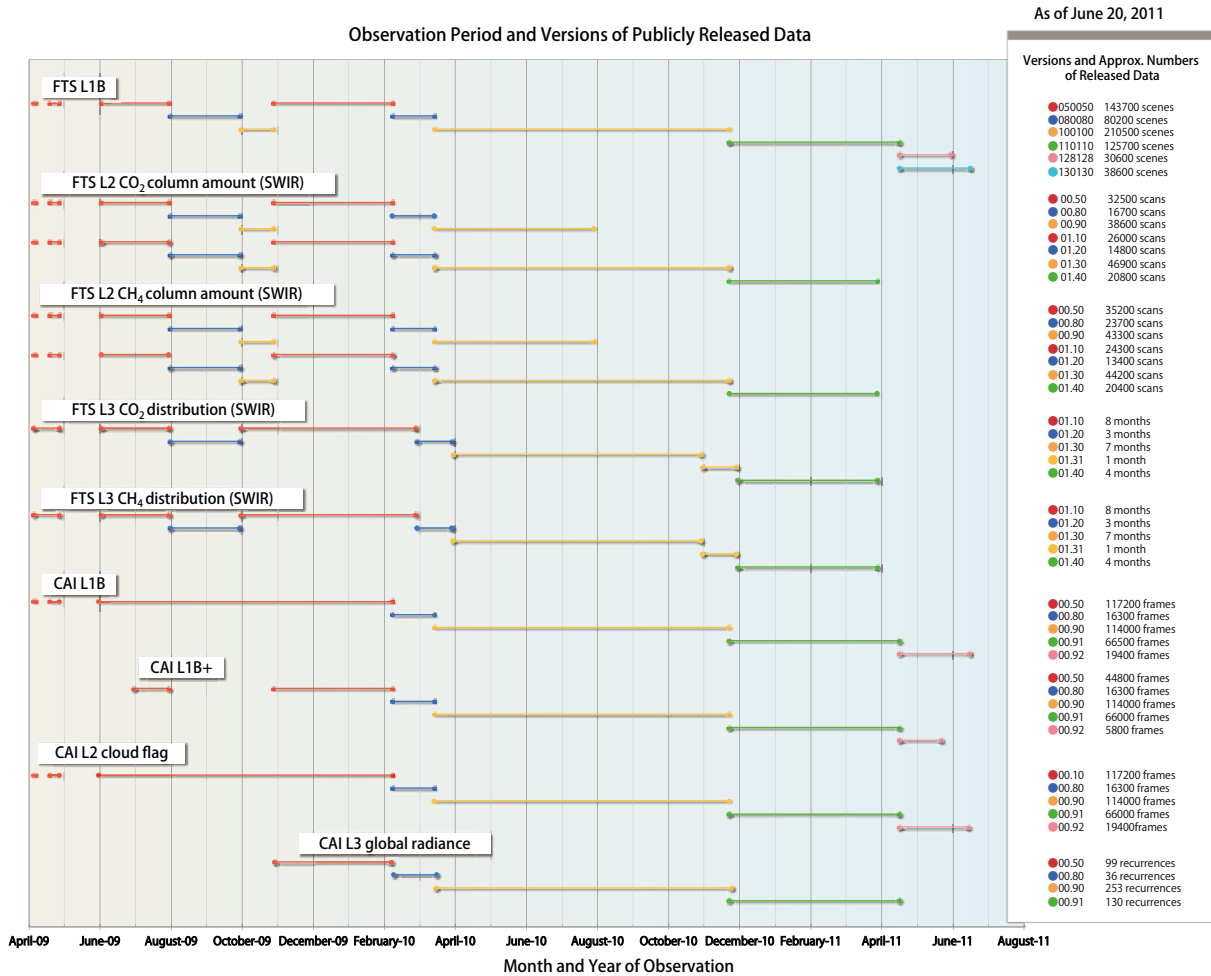
<sup>\*4</sup> CarbonSat is a satellite prepared under the scientific lead of the Institute of Environmental Physics of the University of Bremen. It is selected as one of missions for the Earth Explorer Opportunity Missions of ESA, and the launch is scheduled in 2018. Carbonsat's scientific objectives are to globally measure the concentration of CO<sub>2</sub> and CH<sub>4</sub>, and expected to assume the tasks of SCIAMACHY and GOSAT.

<sup>\*3</sup> Please see <sup>\*3</sup> of page 3.

DATA PRODUCTS UPDATE

# DATA PROCESSING STATUS UPDATE FROM GOSAT PROJECT OFFICE

- Fumie Kawazoe, Specialist, NIES GOSAT Project Office



🌱🌱🌱 Here we report an update on data processing status for late May and early June 2011.

As we reported in the last issue, on April 19, 2011, at 18:15 (UTC), we started processing upgraded versions, V128.128 for the FTS L1B, V00.92 for the CAI L1B, L1B+, L2 cloud flag, and L3 global radiance data products, and V01.50 for FTS L2 CO<sub>2</sub> and CH<sub>4</sub> column amount (SWIR) and FTS L3 global CO<sub>2</sub> and CH<sub>4</sub> distribution (SWIR) data products. For FTS L1B we are now releasing V130.130. Before using the new products, please read the notices on GUIG. ("On the Release of the

New Versions of the GOSAT Level 1 products and Associated Version Upgrade of the Higher Level Products." <http://data.gosat.nies.go.jp/GosatUserInterfaceGateway/guig/doc/20110616en.pdf>)

We also released the latest (March 2011) FTS L2 CO<sub>2</sub>/CH<sub>4</sub> column amounts (SWIR) and FTS L3 global CO<sub>2</sub>/CH<sub>4</sub> distributions (SWIR) as V01.40.

The number of registered users is 1062 as of June 20, 2011.



## ON VERSION UPGRADE OF LEVEL 1 DATA PRODUCTS AND ACCOMPANYING UPGRADES OF HIGHER LEVEL PRODUCTS

- Hiroshi Watanabe, NIES GOSAT Project Office Manager

🌱🌱🌱 We have released updated Level 1 data products on April 19, 2011. The two new versions of Level 1 data products, V128.128 and V130.130 replaced the previous version V110.110.

The changes in FTS Level 1B V130.130 in comparison with previous releases are: non-linear correction of FTS Band 1 and improved Band 4 (TIR). However, if we generate FTS SWIR Level 2 data products with the existing retrieval method using the new FTS Level 1B V130.130 data products, it was found

that there is a significant change in the quality of Level 2 data products. To ensure the continuity of data products, we have decided to release another version, V128.128 that uses the same Band 1 values as V110.110 to generate FTS SWIR Level 2 data products. On the other hand, the updated version of CAI data products to V130.130 is just a formality, and the content remains the same.





## ANNOUNCEMENT NIES SUMMER OPEN HOUSE

🌞🌞🌞 The National Institute for Environmental Studies (NIES) is hosting the annual NIES Summer Open House on July 23, 2011. During the Summer Open House, we are going to open up our research facilities and introduce current environmental issues and the latest research activities at NIES. The NIES GOSAT Project Office is going to exhibit "IBUKI"'s data products on a spherical display. Please register at the main reception for English guided tours (the tour starts at 10:30 and at 14:00 and max. participants for each tour is 20 people). We are looking forward to seeing you all.

**Date :** July 23, 2011 (9 : 30 ~ 16 : 00 (registration closes at 15:00))

**Location :** National Institute for Environmental Studies (Onogawa 16- 2, Tsukuba, Ibaraki)

**Fee :** Free of charge (reservations necessary for parties of more than 15)

**Souvenir :** NIES reusable grocery bags for everyone, and pot plants for those who collect all the stamps

**Travel :** There will be free shuttles from Tsukuba Express Tsukuba Station or from JR Hitachinouchiku Station.

**Inquiry :** +81-29-850-2453 (Public Relations Office, Planning Division, NIES)

**NIES Summer Open House Website (in Japanese) :**

<http://www.nies.go.jp/event/kokai/2011/index.html>



### PUBLISHED PAPERS

**Field of Research:** Carbon balance estimation, atmospheric transport models

**Name of Journal:** Biogeosciences Discuss (Volume 8, Number 3, pages 4239 - 4280)

**Title:** Climate impacts on the structures of the North Pacific air-sea CO<sub>2</sub> flux variability

**Authors:** V. Valsala, S. Maksyutov, M. Telszewski, S.-I. Nakaoka, Y. Nojiri, M. Ikeda and R. Murtugudde

**Field of Research:** Validation

**Name of Journal:** Atmospheric Measurement Techniques (Volume 4, Number 6, pages 1061-1076)

**Title:** Preliminary validation of column-averaged volume mixing ratios of carbon dioxide and methane retrieved from GOSAT short-wavelength infrared spectra

**Authors:** I. Morino, O. Uchino, M. Inoue, Y. Yoshida, T. Yokota, P. O. Wennberg, G. C. Toon, D. Wunch, C. M. Roehl, J. Notholt, T. Warneke, J. Messerschmidt, D.W.T. Griffith, N. M. Deutscher, V. Sherlock, B. Connor, J. Robinson, R. Sussmann and M. Rettinger

### ANNOUNCEMENT

NIES GOSAT PROJECT NEWSLETTER welcomes letters from our readers. We appreciate your opinions, such as "I want to read articles on ..., ""... was really interesting." etc. We also appreciate opinions or contributions from people involved in the GOSAT Project. Please feel free to contact : [gosat\\_newsletter@nies.go.jp](mailto:gosat_newsletter@nies.go.jp). Thank you for supporting the newsletter.

NIES GOSAT PROJECT NEWSLETTER

ISSUE #18 JUN. 2011

Issued On : 2011.07.01

edited and published by : NIES GOSAT Project Office



email : [gosat\\_newsletter@nies.go.jp](mailto:gosat_newsletter@nies.go.jp)

website : <http://www.gosat.nies.go.jp/eng/newsletter/top.htm>

address : 16-2 Onogawa, Tsukuba-City, Ibaraki,

305-8506 Japan

GOSAT Project Office

Center for Global Environmental Research

National Institute for Environmental Studies

You can download this newsletter here:

URL : <http://www.gosat.nies.go.jp/eng/newsletter/top.htm>

If you would like to receive an email notification when each issue is published, please send us an email with your name, email address, and preferred language (English or Japanese) at: [gosat\\_newsletter@nies.go.jp](mailto:gosat_newsletter@nies.go.jp)

Reproduction in any form without publisher's permission is prohibited.