Vol. 4 No. 4, December 2013

RA II WIGOS Project Newsletter

DEVELOPING SUPPORT FOR NATIONAL METEOROLOGICAL AND HYDROLOGICAL SERVICES IN SATELLITE DATA, PRODUCTS AND TRAINING

Contents of this issue

Himawari-8 launch coming soon

Introduction

As mentioned in various meetings, the Japan Meteorological Agency (JMA) plans to launch a new series of geostationary meteorological satellites. This article provides an update on the information previously presented in RA II Pilot Project Newsletter Vol. 1 No. 2 (available at http://www.wmo.int/pages/prog/sat/documents/RA-2-PP_Newsletter-Vol-1-N2.pdf)

Himawari-8 will be launched in the second half of 2014 to formally begin operation in mid-2015. Himawari-9 is also scheduled for launch in 2016. Both will remain in orbit at 140.7 degrees east observing the East Asia and West Pacific regions until around 2030.

Performance advances

Himawari-8 and -9 are identical satellites manufactured by Mitsubishi Electric Corporation, and will each carry an Advanced Himawari Imager (AHI) supplied by Exelis Inc.

Table 1 shows the specifications of the AHI, whose capabilities are comparable to those of the ABI imager on board GOES-R. The functionality of the AHI is greatly improved over that of the MTSAT series' satellite imagers, with main enhancements in the following three areas:

1. More observational spectral bands

The AHI is an imaging radiometer with 16 bands (3 visible, 3 near-infrared and 10 infrared)

Table 1: Specifications of Advanced Himawari Imager (compared with MTSAT imager)

		Himawari-8 and -9	MTSAT-1R and -2
Number of channels and spatial resolution at the sub-satellite point	VIS Near-IR IR	3 (0.5 km to 1 km) 3 (2 km) 10 (2 km)	1 (1 km) 0 4 (4 km)
Imaging speed		< 10 min. (full disk and many area scanning)	< 30 min. (full disk)
Quantization bit rate		11 to 14 bits	10 bits
Design life		8 years	5 years

as compared to MTSAT's 5 bands (1 visible and 4 infrared). This is expected to enhance the accuracy of parameter derivation in various areas, and especially in environmental monitoring.

2. Higher-frequency observation

Himawari-8 will provide full-disk images and data on several smaller designated areas every 10 minutes. This improvement will enable better nowcasting and increased numerical weather prediction skill based on the progress of meteorological studies.

3. Higher spatial resolution

The AHI has a spatial resolution of up to 0.5 km for visible bands and 2 km for infrared bands, which equates to four times as many pixels as those in MTSAT images. This will enable observation of various phenomena with a greater level of detail.

ABI-class imagers will be installed on many other geostationary meteorological satellites in the future. Himawari-8's AHI will be the first next-generation imager to be put into operation, and data derived from it are highly anticipated by satellite operators and users.

Distribution of imagery data

As the improvements described above will result in a much greater volume of data from Himawari-8, the methods of its distribution will be revised. All imagery data will be distributed to National Meteorological and Hydrological Services (NMHSs) via landline in principle.

1. Landline distribution

All NMHSs will be able to access a new JMA Himawari-8 data distribution server via a dedicated line or broadband Internet to obtain all data. The data formats used for this service will be NetCDF, PNG and Himawari Standard Format (JMA's special format for the representation of navigated and calibrated full-resolution data). NMHSs interested in obtaining data via landline should contact JMA as soon as possible (metsat@met.kishou.go.jp).

2. Satellite broadcast

For users with limited Internet access, JMA will disseminate Himawari-8 imagery data via a communication satellite with almost the same content and format as the current HRIT service. This service is tentatively scheduled for introduction in early 2015 in parallel with the direct dissemination of imagery from MTSAT-2 via MTSAT-1R. Users wishing to use the service will need to install new receiving equipment, which will enable free collection of Himawari imagery data. Details on the receiving equipment necessary and the data content will be decided by around May 2014 and announced shortly afterward.

More information

For further information, see JMA's Himawari-8 and -9 web page at http://mscweb.kishou.go.jp/himawari89/index.html.

The page provides information on matters including schedules, spacecraft/AHI specifications and expected spectral response functions (SRF) as well as sample data. As the page will be updated with information on Himawari-8 and -9 as necessary, interested parties should check back occasionally.

(Tomoo Ohno, JMA)

The Nineteenth International TOVS Study Conference (ITSC-19)

The Korea Meteorological Administration (KMA) and the National Meteorological Satellite Center (NMSC) are pleased to announce the nineteenth International TOVS Study Conference, ITSC-19 to take place on Jeju Island, Korea from Wednesday 26 March through Tuesday 1 April 2014. (http://cimss.ssec.wisc.edu/itwg/itsc/itsc19/index.html).

Background

The International TOVS Working Group (ITWG) is convened as a sub-group of the International Radiation Commission (IRC) of the International Association of Meteorology and Atmospheric Physics (IAMAP). ITWG has also provided reports to the Coordination Group for Meteorological Satellites (CGMS) and this now has been also formally recognized as a sub-group of CGMS. The ITWG continues to organize International TOVS Study Conferences (ITSCs) which have met approximately every 18 to 24 months since 1983.

Objectives

Through this forum, operational and research users of satellite sounding data including the TIROS Operational Vertical Sounder (TOVS), the Advanced TOVS (ATOVS) and other atmospheric sounding data build on the TOVS heritage. Working group members exchange information on data processing methods, derived products, and the impacts of radiances and inferred atmospheric temperature, moisture, and cloud fields on numerical weather prediction (NWP) and climate studies.

Conference Topics

The conference will cover a wide range of topics concerning atmospheric sounding, its applications and related issues. We propose that key issues for this meeting include:

- Preparations for and early results from FY-3C and Meteor-3M data
- Updates on operational processing and the exploitation of ATOVS, ATMS, SSMIS and hyperspectral sounder data (AIRS, IASI, CrIS)
- New applications of microwave and infrared sounder data in numerical weather prediction and nowcasting (e.g., new assimilation techniques, bias tuning, use of cloudy radiances), including blended products from polar orbiting and geostationary satellites
- Use of microwave and infrared sounder data over land and ice surfaces
- Generation of geophysical parameters with emphasis on surface emissivity, cloud, and precipitation
- Applications of microwave and infrared sounder data in climate monitoring and GCOS activities
- Direct readout software and retransmission services
- Studies and results for new and future infrared and microwave sounders. Examples include MIS, SAFIRE and MADRAS on Megha Tropiques, geostationary hyperspectral sounders, and others
- Updates on Satellite Programs and International Coordination (WMO, CGMS).

Other important and related issues include the validation and tuning of radiative transfer models, surface models, direct broadcast and community software, especially for METOP, NPP, NPOESS, FY3, METEOR-3M, retransmission of geostationary satellites, satellite sounding requirements for GEOSS, absolute calibration and cross-calibration of the global satellite observing system.

Accommodations

The deadline for making hotel reservations is 10 February 2014. Please fax reservation forms to minimize exposure of your credit card. Email addresses are provided for questions only.

The conference hotel is Lotte Hotel (http://www.lottehoteljeju.com/en/index.asp?lang=English). Reservations can be made by filling out the Lotte Hotel reservation form (available on the ITSC-19 Web site) and submitting the form to the Lotte Hotel (Ms. Hye-Jin Kim, hoteljeju@lotte.net, Fax #82-2-779-1353) with your preference. The rate shown below is after VAT and service charge and includes breakfast.

Room Type	Block available	Rate	Bed Type
Superior Mountain	50	210,000 KRW	Double or Twin
Superior Lake	100	210,000 KRW	Double or Twin

There is an alternate hotel: Jeju Hana Hotel (http://www.hotelhana.co.kr/html/eng/in_010.asp).

This hotel is approximately a 10-minute walk from the conference site. The price listed is after VAT and service charge. Breakfast is not included in the hotel rate but available for 10,000 KRW. Reservations can be made by filling out the Jeju Hana Hotel reservation form (available on the ITSC-19 Web site) and submitting the form to the Hana Hotel (Mr. Youngman Her, hotelhana@hotmail.com, Fax +82-64-738-7015) with your preference.

Room Type	Block available	Rate
Double	5	100,000KRW
Twin	35	100,000KRW
Deluxe Double	5	120,000KRW
Ondol suite	5 (4 people)	140,000KRW

Visa Applications

For those conference attendees who will need a visa to enter the Republic of Korea, please contact the local organisers in order to obtain a letter of invitation:

- Dohyeong Kim (dkim@kma.go.kr)
- Tae-Hyeong Oh (hyoung0203@korea.kr)

Important Dates

Draft Program	**18 January 2014**
Deadline for US$250 registration fee	**31 January 2014**
Hotel Room reservation deadline	**10 February 2014**
Final Program	**15 February 2014**
Deadline for US$350 registration fee	**1 March 2014**
ITSC-19	**26 March ~ 1 April 2014**

✧ The on-site registration fee will be US$400, collected by credit card using the on-line payment form at an on-site computer. There will be no cash option.

International TOVS Working Group (ITWG) Co-Chairs

- Niels Bormann, ECMWF, UK
  Email: n.bormann@ecmwf.int
- Mitchell D. Goldberg, NOAA/NESDIS/JPSS, USA
  Email: mitch.goldberg@noaa.gov

Local Organization Committee (LOC)

Korea Meteorological Administration (KMA)
61 16-Gil, Yeouidaebang-ro, Dongjak-gu,
Seoul, 156-720, Korea
http://www.kma.go.kr/

National Meteorological Satellite Center (NMSC)
64-18 Guam-Gil, Gwanghyewon-myeon,
Jincheon-gun, Chungcheongbuk-do, 365-831,
Korea
http://nmsc.kma.go.kr/

The latest Conference

The ITSC-18
21-27 March 2012
Toulouse, France
Hosted by Météo-France at Météo-France Conference Center
http://cimss.ssec.wisc.edu/itwg/itsc/itsc18/

(Dohyeong KIM, KMA)

Introduction of DAta PROcessing System (DAPROS) for the Geo-KOMPSAT-2A of KMA

The COMS follow-on geostationary meteorological satellite (Geo-KOMPSAT-2A, here after **GK2A**) of Korea will be launched in the first half of 2018. The Advanced Meteorological Imager (AMI) of GK2A will have sixteen spectral bands (Table 2) which are slightly different from ABI of GOES-R and AHI of Himawari-8/9, and will provide three times more spectral information, four times the spatial resolution, and more than four times faster temporal coverage than the

current system.

NMSC/KMA is planning to develop the meteorological **DA**ta **PRO**cessing **S**ystem (here after DAPROS) to produce 52 baseline products from GK2A data and 4 foundation techniques based on the preliminary research result in 2012 (Table 3). It also has started to develop the data processing algorithm in 2013. As a result, the specification of meteorological baseline products has been designed.

The timeline of DAPROS development consists of 3 phases as below:

- Phase I (2013~2015) : algorithm development
- Phase II (2015~2016) algorithm integration and products validation
- Phase III (2017) : Pre-operational and operational evaluation

At the beginning of Phase I, the prototype of 4 baseline product algorithm (stability index, total ozone, snow cover, sea ice cover) and radiative transfer model were developed in 2013.

The research to define the optimal DAPROS development structure was also performed in this year. As the result of the research, the algorithm development group (ADG) sorted into 5 groups according to the application area which will be connected with GK2A data application group after launch. The GK2A AMI algorithm development groups will be kicked off in early 2014 to manage and coordinate development of meteorological products and validation activities.

The prototype of 26 baseline products (see the blue colored products in Table 3) classified as operational products, radiative transfer model and ancillary data of 4 foundation techniques will be developed by next year. This development of phase I will be continuously proceeding belongs to the ground segment development project which will be started from 2014.

(Eunhee Lee, NMSC/KMA)

Table 2: The channel characteristics of Geo-KOMPSAT-2A

Channel	Center Wavelength(μm)			
	AMI	ABI	AHI	MI
1(VIS) blue	0.470	0.470	0.46	
2(VIS) green	0.511		0.51	
3(VIS) red	0.640	0.640	0.64	0.675
4(VIS)	0.856	0.865	0.86	
5(NIR)	1.380	1.378		
6(NIR)	1.610	1.610	1.6	
NIR		2.250	2.3	
7(IR)	3.830	3.90	3.9	3.75
8(WV)	6.241	6.185	6.2	
9(WV)	6.952	6.95	7.0	6.75
10(WV)	7.344	7.34	7.3	
11(IR)	8.592	8.50	8.6	
12(IR)	9.625	9.61	9.6	
13(IR)	10.403	10.35	10.4	10.8
14(IR)	11.212	11.20	11.2	
15(IR)	12.364	12.30	12.3	12.0
16(IR)	13.31	13.30	13.3	

ABI : Advanced Baseline Imager of GOES-R

AHI : Advanced Himawari Imager of Himawari-8/9

Table 3: The candidate products of Geo-KOMPSAT-2A

Scene & Surface Analysis	Cloud & Precipitation	Aerosol	Atmospheric Condition & Composition	Radiance
Cloud Detection	Cloud Top Temperature	Aerosol Detection	Atmospheric Motion Vector	Radiance
Snow Cover	Cloud Top Pressure	Aerosol Optical Depth	Vertical Temperature Profile	Downward SW Radiation (SFC)
Sea Ice Cover	Cloud Top Height	Asian Dust Detection	Vertical Moisture Profile	Reflected SW Radiation (TOA)
Fog	Cloud Type	Asian Dust Optical Depth	Stability Index	Absorbed SW Radiation (SFC)
Sea Surface Temperature	Cloud Phase	Aerosol Particle Size	Total Precipitable Water	Upward LW Radiation (TOA)
Land Surface Temperature	Cloud Amount	Volcanic Ash Detection and Height	Tropopause Folding Turbulence	Downward LW Radiation (SFC)
Surface Emissivity	Cloud Optical Depth	Visibility	Total Ozone	Upward LW Radiation (SFC)
Surface Albedo	Cloud Effective Radius		SO_2 Detection	
Fire Detection	Cloud Liquid Water Path			
Vegetation Index	Cloud Ice water Path			
Vegetation Green Fraction	Cloud Layer/Height			
Snow Depth	Convective Initiation			
Current	Overshooting Top Detection			
	Aircraft Icing			
	Rainfall Rate			
	Rainfall Potential			
	Probability of Rainfall			

Members of the Coordinating Group

JAPAN (Co-coordinator)
Mr Tomoo OHNO
Senior Coordinator for Meteorological Satellite Systems
Satellite Program Division
Japan Meteorological Agency

REPUBLIC OF KOREA (Co-coordinator)
Dr Dohyeong KIM
Senior Researcher
Satellite Planning Division,
National Meteorological Satellite Center
Korea Meteorological Administration

BAHRAIN
Mr Adel MOHAMMED
Supervisor, Meteorology Operation
Bahrain Meteorological Services
Civil Aviation Affairs
Meteorological Directorate

CHINA
Mr Xiang FANG
Director, Remote Sensing Data Application
National Satellite Meteorological Center
China Meteorological Administration

HONG KONG, CHINA
Mr Lap-shun LEE
Senior Scientific Officer
Hong Kong Observatory

INDIA
Mr A. K. SHARMA
Director, Deputy Director General of Meteorology
India Meteorological Department

KYRGYZSTAN
Mr Mahkbuba KASYMOVA
Head, Department of Weather Forecasting
Kyrgyzhydromet

MALDIVES
Mr Ali SHAREEF
Deputy Director General
Maldives Meteorological Service

OMAN
Mr Humaid AL-BADI
Chief, Remote Sensing and Studies Section
Oman Department of Meteorology

PAKISTAN
Mr Muhammad ASLAM
Senior Meteorologist
Allama Iqbal International Airport
Pakistan Meteorological Department

Mr Zubair Ahmad SIDDIQUI
Deputy Director/Senior Meteorologist
Institute of Meteorology & Geophysics
Pakistan Meteorological Department

RUSSIAN FEDERATION
Ms Tatiana BOURTSEVA
Chief, Information Department
ROSHYDROMET

Dr Oleg POKROVSKIY
Principal Scientist, Main Geophysical Observatory
ROSHYDROMET

UZBEKISTAN
Mr Sergey Klimov
Acting Chief, Hydrometeorological Service
UZHYDROMET

VIETNAM
Ms Thi Phuong Thao NGUYEN
Researcher, Research & Development Division
National Center for Hydrometeorological Forecasting
Ministry of Natural Resources and Environment of Viet Nam

EUMETSAT (OBSERVER)
Dr Volker GAERTNER
Head of User Services Division
EUMETSAT

Dr Kenneth HOLMLUND
Head of Meteorological Operations Division
EUMETSAT

From the Co-editors

The co-editors invite contributions to the newsletter. Although it is assumed that the major contributors for the time being will be satellite operators, we also welcome articles (short contributions of less than a page are fine) from all RA II Members, regardless of whether they are registered with the WMO Secretariat as members of the WIGOS Project Coordinating Group. We look forward to receiving your contributions to the newsletter.

(*Dohyeong KIM, KMA, and Tomoo OHNO, JMA*)

RA II WIGOS Project Home Page

http://www.wmo.int/pages/prog/sat/ra2pilotproject-intro_en.php
(To be updated)

Editorials and Inquiries

Tomoo OHNO (Mr.)
Senior Coordinator for Meteorological Satellite Systems
Satellite Program Division
Observations Department
Japan Meteorological Agency
1-3-4 Otemachi, Chiyoda-ku
Tokyo 100-8122, Japan

Tel: +81-3-3201-8677
Fax: +81-3-3217-1036
Email: tom.ohno@met.kishou.go.jp

Dohyeong KIM (Dr.)
Senior Researcher
Satellite Planning Division,
National Meteorological Satellite Center
Korea Meteorological Administration
64-18 Guam-gil, Gwanghyewon, Jincheon,
Chungbuk, 365-830, Republic of Korea

Tel: +82-70-7850-5705
Fax: +82-43-717-0210
Email: dkim@kma.go.kr

(Editor-in-chief of this issue: Tomoo OHNO)