The 5th GEMS Science Team Meeting

Date : October 7– 10, 2014 Venue : Hotel President / Yonsei University, Seoul, Korea

October 7th (Tue.)

Venue : Brahms Hall (19F), Hotel President

- 09:00 10:00 Registration
- **10:00 10:10 Opening**

Chair: J. Kim(Yonsei Univ.)

10:00 – 10:10 Welcome Remark Jin-suk Han (Director General, Climate & Air Quality Research, NIER)

- 10:10 10:20 Group Photo and short break
- **10:20 11:20** Status of GEO-KOMPSAT 2 and GEMS Mission

Chair: M. H. Ahn(Ewha Womans Univ.)

10:20 - 10:40	Status of GEO-KOMPSAT 2	
		S.R. Lee (KARI)
10:40 - 11:00	Status of GEMS Development	
11.00 11.00		S.H. Lee (KARI)
11:00 - 11:20	Predicted Performance of GEMS	
		J. Kim (Yonsei Univ.)

11:20 – 12:20 Status of International Missions (I)

Chair: J. Kim (Yonsei Univ.)

11:20 - 11:40	Implementation of Tropospheric Emissions: Monitoring of Pollution (TEMPO)
	Kelly Chance (Harvard Smithsonian CfA)
11:40 - 12:00	A science mission for the Polar Communications and Weather Satellite
	Tom McElroy (York Univ.)
12:00 - 12:20	The role of airborne campaigns in preparing for the geostationary air quality era
	Jay Al-Saadi and Jim Crawford (NASA LaRC)

12:20 – 14:00 Lunch

14:00 – 15:15 Ozone

Chair: David Edwards (NCAR)

14:00 – 14:20 Application of OMPS limb data for improving the estimation of

GEMS tropospheric trace gases and aerosols

P.K. Bhartia	(GSFC,	NASA)

- 14:20 14:40 The TOMS V9 algorithm applied to hyperspectral sensors David Haffner (SSAI/GSFC, NASA)
- 14:40 15:00 Vertical profile of tropospheric ozone derived from joint retrieval using three different wavelength channels, UV, IR, and Microwave: a sensitivity study for satellite observation

Mona E. Mahani (Tohoku Univ.)

15:00 - 15:15 *Status of GEMS Ozone Algorithm

Jae. H. Kim (Busan National Univ.)

- 15:15 15:40 Coffee Break
- 15:40 16:00 Status of International Missions (II) (Webex)
 - 15:40 16:00 Current status of TROPOMI and the plans for the near-future Pepijn Veefkind (KNMI)

16:00 – 18:00 Aerosol, Clouds and Surface Properties Chair: Jae H. Kim (Busan National Univ.)

16:00 – 16:20 A ten year record of Aerosol Absorption over East Asia from OMI observations.

Omar Torres (GSFC, NASA)

- 16:20 16:40 Assessment of OMI Near UV Aerosol Products Changwoo Ahn (SSAI/GSFC, NASA)
 16:40 – 16:55 *Status of GEMS Aerosol Retrieval Algorithm
 - Mijin Kim and Jhoon Kim (Yonsei Univ.)
- 16:55 17:15 Derivation of optical centroid cloud pressures from O2O2 slant column measurements

Eun-Su Yang (SSAI/GSFC, NASA)

- 17:15 17:30 *Status of GEMS Cloud Algorithm
- Yong Sang Choi (Ewha Womans Univ.) 17:30 – 17:45 *Aerosol effective height from O2-O2 measurements
- Sangseo Park (Yonsei Univ., and NCAR) 17:45 – 18:00 *Status of GEMS Surface Algorithm

Jung Moon Yoo (Ewha Womans Univ.)

<u>* Talks for 15 minutes as the details are presented on Oct. 10th.</u>

18:30 – 21:00 GEMS ST Dinner (All)

Venue : Hotel President (31F)

Venue : Brahms Hall (19F), Hotel President

09:00 – 10:50 Modeling and Application

Chair: Rokjin Park (Seoul National Univ.)

- 09:00 09:15 *Status of GEMS Data Assimilation
- Seon Ki Park (Ewha Womans Univ.) 09:15 – 09:35 The Atmospheric Composition Geostationary Satellite Constellation for Air Quality and Climate Science: Evaluating performance with Observation System Simulation Experiments

David Edwards (NCAR)

09:35 – 09:55 Next generation geostationary AOD retrievals improve air quality predictions

Greg Carmichael (Univ. of Iowa)

09:55 – 10:10 *A comparison study between CMAQ-simulated and OMI-retrieved NO2 columns over East Asia for evaluation of NOx emission fluxes of INTEX-B, CAPSS and REAS inventories

K.M. Han and C.H. Song (GIST)

10:10 – 10:30 Understanding the links between emissions, chemistry and NO2 retrievals

Ronald C. Cohen (Univ. of California, Berkeley)

10:30 – 10:50 Evaluation of NOx emission over East Asia using OMI and MAX-DOAS observations and regional model simulations

Si-Wan Kim (NOAA)

10:50 – 11:00 Short Break

- **11:00 12:20** Calibration/Validation (I) Joint session with uvSCOPE validation Chair:Hanlim Lee (Pukyoung Nat'l Univ.)
 - 11:00 11:20 uvSCOPE: A Pollution observation mission from International Space Station

Yasko Kasai (Tokyo Institute of Technology, NICT)

11:20 – 11:40 Long-term MAX-DOAS network observations of NO2 in Russia and Asia (MADRAS) during 2007-2012: Comparisons with OMI satellite observations

Yugo Kanaya (JAMSTEC)

11:40 - 12:00 Tropospheric ozone climatology derived from ozonesonde, airborne and space borne measurements over East Asia Sachiko Hayashida (Nara Women's Univ.) and Xiong Liu (Harvard Smithonian CfA)

12:00 – 12:20 Utilizing SKYNET for GEMS validation

Hitoshi Irie (Chiba Univ.)

12:20 – 13:45 Lunch

13:45 – 15:35 Calibration/Validation (II)

Chair: Jay Al-Saadi (NASA LaRC)

TEMPO validation
Mike Newchurch (UAH)
Slit function/wavelength calibration for TEMPO
Xiong Liu (Harvard Smithsonian CfA)
*Spectral Calibration of GEMS
M.H. Ahn (Ewha Womans Univ.)
GOAHEAD: The Global Ozone and Aerosol profiles and Aerosol
Hygroscopic Effect and Absorption optical Depth (GOA2HEAD)
Network Initiative – A Novel Approach to Atmospheric
Measurements
Si-Wan Kim and Ru-Shan Gao (NOAA)
Observational constraints on atmospheric chemical processes from
aircraft and ground based glyoxal measurements
Kyung-Eun Min (NOAA CSD/CIRES)
INR of GEO-KOMPSAT 2b
K.R. Yong (KARI)

15:40 – 16:00 Coffee Break

16:00	- 17:50	Gases

Chair: Hitoshi Irie (Chiba Univ.)

1	6:00 - 16:20	Global free tropospheric NO2 abundances derived using a cloud slicing technique applied to satellite observations from the Aura
		Ozone Monitoring Instrument (OMI)
		Sungyeon Choi (SSAI/GSFC, NASA)
1	6:20 – 16:40	Status of GEMS NO2 Algorithm
		Hanlim Lee (Pukyong Nat'l University)
1	6:40 – 17:00	Impact of a priori information on satellite NO2 and HCHO retrieval
		over the Los Angeles Basin
		Si-Wan Kim (NOAA)
1	7:00 - 17:20	NO2 and H2CO Observations from the Ozone Mapper and Profiler
		Suite on Suomi NPP
		Thomas Kurosu (JPL, NASA)
1	7:20 – 17:35	*Status of GEMS HCHO Algorithm
		Rokjin Park (Seoul National Univ.)
1	7:35 – 17:50	*Status of GEMS SO2 Algorithm
		J.H. Jeong and Y.J. Kim (GIST)

17:50 – 18:05 GEMS Unified Data Processing Package

17:50 – 18:05 *GEMS Unified Data Processing Package

Y.K. Ki and J.B. Lee (Saeasoft Co.)

October 9th (Thu.)

Venue : 523 Science Hall, Yonsei Univ.

09:00 - 17:50 TUTORIAL LECTURES

09:00 - 09:50	Lectures I – By Greg Carmichael (Iowa State University) "Data Assimilation Basics"
09:50 - 10:00	Break
10:00 - 10: 50	Lectures II - By Xiong Liu (Harvard Smithsonian CfA) "An Introduction to the Optimal Estimation and Its Application to Ozone Profile Retrieval from Satellite UV Measurements"
10:50 - 11:00	Break
11:00 - 11:50	Lectures III - By Kelly Chance (Harvard Smithsonian CfA) "Atmospheric physics applied to data analysis algorithms"
11:50 - 13:00	Lunch
13:00 - 13: 50	Lectures IV – By P.K. Bhartia (GSFC, NASA) "Estimation of uncertainties in GEMS derived trace gas columns and ozone profiles"
13:50 - 14:00	Break
14:00 - 14: 50	Lectures V – By David Edwards (NCAR) "Measurement of tropospheric pollution from space: principle"
14:50 - 15:00	Break
15:00 - 15:50	Lecture VI – By Omar Torres (GSFC, NASA) "Remote Sensing of aerosols in UV"
15:50 - 16:00	Break
16:00 - 16:50	Lecture VII – By Thomas McElroy (York Univ.) "Introduction to Retrieval"

16:50 – 17:00 Break

+ If you need desk and network on this day, please use Room 549 of Science Hall (Office of Jhoon Kim is at Room 545.), Yonsei Univ. [Room keypad password : 8899]

October 10th (Fri.)

Venue : Seminar Room (7F), Yonsei-Samsung Library, Yonsei Univ.

- Reviewer: all international participants, GEMS Science Team Members

* Review for GEMS Algorithm and Model Application Studies (Each presentation in 25 minutes and discussions/comments in 20 minutes)

08:50 - 09:00	Introduction
09:00 - 09:45	Data quality & Cal/Val
09:45 - 10:30	Myoung Hwan Ahn (Ewha Womans Univ.) Development of Ozone retrieval algorithm Lae Hwan Kim (Pusan Nat'l Univ.)
10:30 - 11:15	Development of Formaldehyde retrieval algorithm Rokijn Park (Seoul Nat'l Univ.)
11:15 - 12:00	Development of NO2 retrieval algorithm Hanlim Lee (Pukyoung Nat'l Univ.)
12:00-13:00	Lunch
13:00 - 13:45	Development of SO2 retrieval algorithm
13:45 - 14:30	Development of Aerosol retrieval algorithm
14:30 - 15:15	Jhoon Kim (Yonsei Univ.) Development of Surface information retrieval algorithm Myeong-Jae Jeong(GWNU) and Jung Moon Yoo (Ewha Womans Univ.)
15:15 – 16:00	Development of RTM for GEMS Kwang-Mog Lee (Kyungpook Nat'l Univ.)
16:00 - 16:10	Coffee Break
16:00 - 16:45	Development of Cloud detection algorithm
16:45 – 17:30	GEMS Unified Data Processing Package
16:45 - 17:30	CTM & Emission
17:30 - 18:15	Data Assimilation Seon Ki Park (Ewha Womans Univ.)

Hotel Reservation

(Hotel President : http://www.hotelpresident.co.kr/).

If you plan to stay at the Hotel President, the workshop venue, you can get the room at the special rate (150,000 KRW, which is about 146 USD, +15,000 KRW for breakfast). When you make a reservation, please inform that you are GEMS meeting participant

For reservation, please email to <u>marketing@hotelpresident.co.kr</u> with your dates of check-in and –out, and approximate arrival time.

Directions and restaurants

*Venue: Hotel President, 16, Euljiro, Jung-Gu, Seoul, 100-191

(TEL) +82-2-753-3131

(Web) http://www.hotelpresident.co.kr



Numbers indicate the restaurant locations.

 (\rightarrow) : Red arrow indicates the direction from Euljiro 1(il)-ga subway station to the venue

[Direction]

If you take subway, you should take the Incheon Airport Railroad Express (AREX) and stop at Hongik Univ. station. Then, you can transfer to line No.2(Green line) and take off at Euljiro 1(il)-ga station.

There are eight exits at the Euljiro 1(il)-ga Station. Please take Exit No.8 (There is a Lotte Hotel on your left side at Exit No.8) and go straight along the Eulji-ro to west which is shown in the map.

After about ~200 m away from the exit No.8, you may find Hotel President in front of you. <u>http://english.arex.or.kr/jsp/eng/main.jsp</u>

[Bus]

If you plan to use the Limousine Bus from the Inchon airport to the Hotel President, please use a 3^{rd} bus stop of Limousine Bus No.6701(3 minutes on foot). It takes you about 80 min. from Inchon airport to the Lotte Hotel Downtown.

The Limousine Bus No.6701 service route

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; Incheon Int'l airport \rightarrow Hotel Koreana \rightarrow Hotel Plaza \rightarrow Lotte Hotel
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[Taxi]

You can also take a taxi which may cost you around 70 USD (regular taxi, for the black-colored deluxe taxi, you pay double). Most of the taxi (with orange color tag 'Card') accept credit card (see picture below). Otherwise, you need local currency.



(Roof sign for taxis which accept credit card)

[Restaurant & Cafe near the hotel President]

- ① KHUATHAI(쿠아타이) Thai Food Restaurant (₩15,000~₩30,000)
- ② CHUGAZIP(처가집) Korean Food Restaurant(₩9,000~₩40,000)
- ③ HANILGWAN(한일관) Korean cold noodles and dumpling(₩10,000~₩20,000)

④ JEONJUHALL(전주회관) – Korean Food(Bibimbap) Restaurant(₩7,000~₩40,000)

⑤ CAFÉ MAMAS(카페 마마스) – Panini with Soup, Salad and Sandwich

 $(\$7,000 \sim \$15,000)$

⑥ CALIFORNIA PIZZA KITCHEN(캘리포니아 피자 키친) – Pizza and Pasta

(₩20,000~₩40,000)

⑧ OUTBACK STEAKHOUSE(아웃백 스테이크하우스) – Family Restaurant

(₩15,000~₩40,000)

⑨ Mr. PIZZA(미스터피자) – Pizza and Pasta (₩15,000~₩30,000)

⑩ VIPS(빕스 명동중앙점) – Brunch, Steak and Salad Bar (₩20,000~₩40,000)

(₩10,000 = \$10.00)

Transport from Hotel President to Yonsei University

[Subway]

Use Seoul Metro Line 2 (green color) at Seoul City Hall Station to Sinchon Station. Take exit No. 2 or 3 to Yonsei University.

[Taxi]

Take taxi across the street of the Hotel President (Same side as Seoul City Hall) and ask the driver "Yonsei Dae(연세대)" or "Yonsei Dae Hak Gyo (연세대학교)". The fare is ~\$7(₩7,000).

* Campus Map of Yonsei University, Seoul



* Due to constructions inside our campus from the Main Gate to University Headquarter, please use <u>"SOUTH GATE"</u> for your access to Science Hall and Digital Library. When you come to Digital Library on October 10th, please use west entrance of the library to avoid ID check.

* If you have any questions or need translations, please call

Woogyung Kim, 010-3393-0806 Sujeong Go, 010-5745-1952