CONCEPT NOTE

Workshop on remote sensing data for air pollution monitoring and management

09:00-17:00 (UTC+8), 2-3 May 2024

Information and Research Institute of Meteorology, Hydrology and Environment, Ulaanbaatar, Mongolia

I. Background

In February 2020, the Geostationary Environment Monitoring Spectrometer (GEMS) was launched by the Republic of Korea. It is the first of the three-satellite constellation which enables the hourly monitoring of air pollution levels for almost 20 countries in Asia. This marks a significant leap forward in the ability of scientists to monitor air pollution from space.

Previously, air quality monitoring has been mainly based upon in-situ measurements by Governments using ground-based air quality monitoring networks within their territories. However, ground-based monitoring has limitations since monitoring stations are mostly concentrated in densely populated cities with rigid installation requirements and very narrow spatial coverage. Furthermore, air pollution monitoring stations are often based in urban areas, and yet pollutants can be generated or travel great distances and affect not only rural areas but also on a transboundary basis. Satellite observations complement the ground-based networks by providing data over wider areas, which is particularly useful for regions where no surface monitors are installed, such as rural areas or countries with limited air pollution monitoring equipment or capacity. For example, the regular measurement of O3 and its precursors NOx and volatile organic compounds, along with particulate matter, SO2 and other pollutants, will improve the accuracy of air quality forecasts, top-down emission rates and understanding on long-range transport of air pollutants. This satellite-derived data will help evaluate and improve air quality and chemical transportation models, emissions inventories and allow the better production of hourly air pollution forecasts which are accessible to the public through a broad range of platforms and applications. It can fill in information gaps left by ground-data collected through monitoring stations to help evidence-based policy making to address not only national and local air quality, but transboundary pollution issues.

The secretariat will organize a two-day workshop “Adhoc workshop on remote sensing data for air pollution monitoring and management”, with the support from Information and Research Institute of Meteorology, Hydrology and Environment (IRIMHE), Korea International Cooperation Agency (KOICA), and National Institute of Environmental Research (NIER). This workshop aims to build capacity of personnel in national space and environment related agencies or ministries on operation and maintenance of the Pandora in-situ instrument for air pollution monitoring and management.

II. Objectives

1. To enhance the capacity of government agencies in target countries to strengthen

national level air pollution monitoring and management.

III. Expected Outcomes

1. Enhanced capacity of national environment and space related agencies or ministries in target countries to operate and maintain the Pandora spectrometer system for air pollution monitoring.

2. Enhanced capacity of national space agencies, environment ministries and relevant ministries in target countries responsible for space applications and air pollution management, to utilize remote sensing data.

IV. Venue and Date/Time

Venue: IRIMHE, Ulaanbaatar, Mongolia
(https://maps.app.goo.gl/pxhp8KqvXaRmXMQe7)

Date/Time: 09:00-17:00 (UTC+8), 2-3 May 2024

V. Organizers/Participants

1. Information and Research Institute of Meteorology, Hydrology and Environment (IRIMHE)
2. Central Laboratory for Environmental Monitoring (CLEM)
3. National Agency of Meteorology and Environmental Monitoring (NAMEM)
4. United Nations Economic and Social Commission for Asia and the Pacific (ESCAP)

VI. Draft Programme

The programme consists of hands-on practice with Pandora instrument, lectures, and presentations on the following topics:

- For beginner practitioners of Pandora spectrometer
    - Introduction to Pandora spectrometer and data
    - Hands-on practice of Pandora installation, operation, and maintenance
- For intermediate and advanced practitioners of Pandora data
    - Pandora data applications
    - Calibration of GEMS and TROPOMI data using Pandora data

Programme Schedule:

Hour/Day	0900 -0930	0930-1100		1100-1130	1130-1230	1230-1330	1330-1430	1430-1500	1500-1630	1630-1700
02/05/24	Transport	Pandora Practice		BREAK	Pandora Practice	LUNCH BREAK	Pandora Practice	BREAK /Transport	Field visit to new Pandora site	Wrap Up
Hour/Day	0900 -0930	0930-1000	1000-1100	1100-1130	1130-1230	1230-1330	1330-1430	1430-1500	1500-1600	1600-1700
03/05/24	PREP/ Registration	Opening & Photo session	SESSION 1 Lecture	BREAK	SESSION 2 Lecture	LUNCH BREAK	SESSION 3 Lecture	BREAK	SESSION 4 Presentation	SESSION 5 Bilateral Meeting

Agenda:

Day 1: Thursday, 2 May 2024		
Time (UTC+8)	Topics	Venue
09:00 – 09:30	Transport to Pandora site	Ulaanbaatar Pandora site
09:30 – 11:00	**Session 1. Pandora Practice** **Lecturer:** Mr. Ukkyo Jeong, Professor, Pukyong National University Hands-on practice with Pandora spectrometer - Installation - Maintenance - Operation	
11:00 – 11:30	Break	
11:30 – 12:30	**Session 2. Pandora Practice** **Lecturer:** Mr. Ukkyo Jeong, Professor, Pukyong National University Hands-on practice with Pandora spectrometer - Installation - Maintenance - Operation	
12:30 – 13:30	Lunch Break	
13:30 – 14:30	**Session 3. Pandora Practice** **Lecturer:** Mr. Ukkyo Jeong, Professor, Pukyong National University Hands-on practice with Pandora spectrometer - Installation - Maintenance - Operation	
14:30 – 15:00	BREAK/Transport to new Pandora site	New Pandora

15:00 – 16:30	**Session 4. Field visit** Field visit to new Pandora spectrometer installation site in CLEM	Zuun-ail candidate site
16:30 – 17:00	Wrap up	
Day 2: Friday, 3 May 2024		
Time (UTC+8)	Topics	Venue
09:30 – 10:00	**Session 5. Opening session** **Moderator:** Mr. Enkhbaatar Davaanyam, IRIMHE Opening remarks by: - Ms. Ganjuur Sarantuya, Director, IRIMHE - Mr. Tapan Mishra, UN Resident Coordinator of Mongolia - UN ESCAP (TBD) Photo session	IRIMHE
10:00 – 11:00	**Session 6. Lecture** **Lecturer:** Mr. Ukkyo Jeong, Professor, Pukyong National University Lecture topics: - Introduction to Pandora spectrometer and data - Pandora data applications - Calibration of GEMS and TROPOMI data using Pandora data	
11:00 – 11:30	Break	
11:30 – 12:30	**Session 7. Lecture** **Lecturer:** Mr. Ukkyo Jeong, Professor, Pukyong National University Lecture topics: - Introduction to Pandora spectrometer and data	

	- Pandora data applications - Calibration of GEMS and TROPOMI data using Pandora data	
12:30 – 13:30	Lunch Break	
13:30 – 14:30	**Session 8. Lecture** **Lecturer:** Mr. Ukkyo Jeong, Professor, Pukyong National University Lecture topics: - Introduction to Pandora spectrometer and data - Pandora data applications - Calibration of GEMS and TROPOMI data using Pandora data	
14:30 – 15:00	Break	
15:00 – 16:00	**Session 9. Presentation** **Moderator:** ESCAP (TBC) Presenters: - ESCAP - IRIMHE - NAMEM	
16:00 – 17:00	**Session 10. Bilateral Meetings** ESCAP IRIMHE	
17:00 – 17:30	Wrap up	

VII. Audience

1. Professionals, practitioners, and staff members in national environment and space related agencies or ministries relevant to operation of Pandora instruments for air pollution monitoring and management.

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