Summary of the Eleventh Meeting of Working Group I for Joint Research on Dust and Sand Storms Tokyo, 15th -16th November 2018

1. The eleventh meeting of the Working Group I (WG I) for Joint Research on Dust and Sand Storms (DSS) under the Tripartite Environment Ministers Meeting (TEMM) was held at Keio Presso Inn Ikebukuro, Tokyo, Japan from 15th -16th November 2018. Representatives from China, Japan and Korea participated in this meeting (Annex1: List of participants).

2. In Session One, Mr. Tetsuya TAKAZAWA, Director of Air Environment Division, Ministry of the Environment, Japan (MOEJ) delivered opening remarks and warmly welcomed to the participants. Dr. Nobuo SUGIMOTO from National Institute for Environmental Studies (NIES) introduced the agenda of the meeting, which was adopted by all participants. All participants took a moment to introduce themselves to each other. The group took its official photos between the Sessions two and three.

3. In Session Two on "Looking Back at Discussion and Activities" chaired by Dr. Sang-Sam LEE from National Institute of Meteorological Sciences, Korea Meteorological Administration (NIMS/KMA), two participants made their presentations. Mr. Yasushi HIEDA from Overseas Environmental Cooperation Center, Japan (OECC) made a presentation on "Overview of the last DSS-WG I meeting, SCM, DGM and TEMM". In his presentation, he summarized the 10th Meeting of WG I (8th - 11th November 2017 in Lanzhou, China) and also introduced other related meetings such as the 12th SCM and the13th DGM (30th May 2018 in Suzhou, China), Tripartite Joint Workshop between WG I and WG II (23rd June 2018 in Suzhou, China) and the 20th TEMM (23rd-24th June 2018 in Suzhou, China).

4. Dr. Sang-Sam LEE from NIMS/KMA made a presentation on the current status of DSS2016 data sharing. According to his report, HIMAWARI-8 satellite data (Aerosol Optical Thickness (AOT), AOT_pure, AOT_uncertainty, AOT_Pure_uncertainty, Angstrom Exponent (AE), AE_Pure, Quality Assurance (QA)_flag, QA_flag_Pure) were newly added from Japan. He requested for all participating countries to reload data on web-hard (http://www.webhard.net) for those the quality checks are needed. And he expressed his thanks to all participating countries for sharing their data.

5. In Session Three on "The Study on DSS Monitoring and Modeling from Each Country" chaired by Mr. Liang LI from China National Environmental Monitoring Centre of Ministry of Ecology and Environment of P. R. China (CNEMC/MEE), five participants made their presentations. Mr. Takashi MAKI from Meteorological Research Institute (MRI) reported "The Study on DSS Monitoring and Modeling from Japan." He reported that MASINGAR mk-2 captured 2016 DSS events but almost overestimated aerosol concentrations. He considered that he should modify dust emission processes of the model. The reason may be surface conditions. He needs more data near the dust source region on not only the dust concentrations and meteorological data but also on the land surface related data to improve the dust aerosol model.

6. As a preliminary examination and to demonstrate the new Himawari-8 satellite performance, Dr. Itsushi UNO and Dr. Zhe WANG from Kyushu University made presentations entitled "Atmospheric Environment Modeling at Kyushu University: Dust and Pollution Analysis for May 2017." During the

year of 2017, the Japan Meteorological Agency only observed the dust during May 6th and 8th. This is a good target for our next joint analysis. They clearly reported two big dust events occurred from April 29 to May 7, 2017. Dr. UNO reported the first dust event occurred over Taklimakan Desert, and showed the Advanced Himawari-8 Imager (AHI) clearly captured the dust vortex changes every 10 min. interval and verified the performance of AHI. Dr. WANG reported the second dust event mainly occurred over the Gobi Desert and then travelled over the China, Korea and then Japan. They compared the dust concentrations observed and simulated by NAQPMS, and suggested the importance of the heterogeneous reactions on the formation of polluted dusts.

7. Mr. Hee Choon LEE from NIMS/KMA made a presentation entitled “Current status of dust/haze monitoring and forecasting in KMA”. He introduced the improvement of KMA dust/haze model, called as ADAM3, in the dust emission algorithm and the data assimilation of surface PM data. He also reported that the data assimilation method of ADAM3 would be changed into an ensemble-based 3-D variational technique within a couple of years.

8. Mr. Liang LI from CNEMC/MEE made a presentation on 2016 annual report on monitoring of Dust and Sandstorm in China. He showed the number of days that DSS occurred and pointed out that the accumulative number of days that exceeds the level of an air quality standard was 325 days in 338 key cities in 2016. According to Mr. LI, the climate factors in the dust source area are conducive to the occurrence and transportation of dust in 2016 in China. He also explained the revision of China's national ambient air quality standards.

9. Mr. Wei WANG from CNEMC/MEE made a presentation titled "Analysis of a typical severe DSS event in 2016". He showed that a strong DSS event in March 2016 impacted air quality seriously in the north, north-east and middle parts of China, with PM10 concentrations of more than 1000μg/m3 observed near sand source regions. Mid-latitude cyclones and strong wind in front of high-pressure system caused this DSS event meteorologically. Comparison of model and measurement showed that NAQPMS simulated occurrence and path of this DSS well, except underestimating intensity and missing the north-east China.

10. In Session Four on “Report from the Countries on DSS Events” chaired by Mr. Hee Choon LEE from NIMS/KMA, two participants made their presentations. Dr. Yun Kyu LIM from NIMS/KMA made a presentation entitled “Analysis of model (ADAM3) and observation data in DSS 2016 cases”. In his presentation, three cases of DSS 2016 event were analyzed with observation data and numerical model results (ADAM3). He mentioned that total PM10 amounts were affected by not only Asian dust but also anthropogenic emissions.

11. Dr. Atsushi SHIMIZU from NIES proposed a typical Asian dust event in May 2017 in order to share the observation results among three countries. Also a method to distinguish long range transported Asian dust and locally generated dust in Kanto, Japan was presented.

12. In Session Five on “Report from the Countries: Free Themes” chaired by Mr. Liang LI from CNEMC/MEE, two participants made their presentations. Ms. Jingyan LI from CNEMC/MEE made a presentation on the influence of DSS on ambient air quality in urban China. A method was applied to identify the DSS influence on up-to-down-stream cities based on the time variation of PM10 and PM2.5/PM10. This method worked well to separate fine-particle pollution and DSS pollution. Three main routes of DSS in 2016 were summarized. Contributions of DSS on yearly particle concentration and air pollution days on different province were compared.

13. Dr. Sang-Sam LEE from NIMS/KMA made a presentation on the chemical composition change according to pathway of weak Asian dust during June 2015. He identified different chemical compositions along with different pathway of aerosol. From the chemical analysis between Gosan and Fukuoka on 12 June 2015, local pollution effect in Fukuoka was supposed. Also chemical analysis between Gosan and Seoul gives us dust transport from Gosan to Seoul during 12-13 June 2015. He emphasized this case might be a good example of coupling the Korean and Japanese chemical analysis data.

14. In Session Six on "Discussions on future cooperation and next steps" chaired by Ms. Yayoi HAYASHI from OECC, one participant made his presentation. Mr. Nobuyuki KONUMA from MOEJ, introduced a proposal to review the current mid-term Action Plan (2015-2019) and thoughts for the next mid-term Action Plan (tentatively from 2020), and highlighted the idea of incorporating new, cross-cutting themes such as DSS and climate change, health effect of DSS and bio-aerosol DSS, and literature review surrounding DSS. Mr. KONUMA and Dr. Sang Boom RYOO from NIMS/KMA proposed a general timeline from now to 2020 to start the next Action Plan and stressed the importance of exploring further involvement of both the experts from other areas and government officials toward the future.

15. The WG I participants suggested on the future milestones of WG I as follows:

    1) A proceeding report of activities related to current mid-term action plan (2015-2019) and draft of a new mid-term action plan (tentatively from 2020), which will be drafted by Japan and Korea, respectively, will be submitted to pre-TEMM 22 SCM and DGM (2020).
    2) Before next WG I meeting in Korea, three countries will on a voluntary basis respectively propose the contents of new mid-term action plan, such as linkage effects between DSS and climate change issues, etc. through emails, and Korea will summarize the proposed contents in the draft.
    3) Prepared proceeding report and a draft of a new mid-term action plan (tentatively from 2020) will be discussed and adopted in the next WG I meeting (Korea).

16. The participants decided two DSS events i.e. April 18-23, May 1-10, 2017 as the target for joint research. The three countries decided to share the observation data during the period from April 18 to May 10, 2017. The countries will upload the data designated website by the end of May, 2019.

17. Before closing, it was announced that the 12th meeting of WG I will be held in late September in Busan, Korea. As the host country of the next WG I meeting, Korea will propose the detailed date, venue, and timeline for preparing agenda and meeting materials more than 3 months before the meeting.

The 11th Meeting of Working Group I Joint Research on Dust and Sand Storms
Tokyo, Japan
(15th – 16th November 2018)

Meeting Agenda

■ Day 1 (15th November)

9:00-9:30	Registration
Session Ⅰ Opening Session **Chair: Dr. Nobuo SUGIMOTO (*Japan*)**	
9:30-9:35	Opening Remarks Mr. Tetsuya TAKAZAWA, Ministry of the Environment, Japan
9:35-9:40	Introduction of Participants
9:40-9:45	Adoption of the agenda
9:45-9:50	Group photo
Session Ⅱ Looking Back at Discussion and Activities **Chair: Dr. Sang Sam LEE (*Korea*)**	
9:50-10:10	*Japan : Overviews of the 10th Meeting of WG(I) for Joint Research on DSS (Mr. Yasushi HIEDA)*
10:10-10:25	*Korea*: *Current Status of DSS2016 Data Sharing* *(Dr. Sang-Sam LEE)*
10:25-10:40	*discussions*
Session Ⅲ The Study On DSS Monitoring and Modeling From Each Country **Chair: Mr. Liang LI (*China*)**	
10:40-11:10	*Japan: The Study on DSS Monitoring and Modeling from Japan* *(Mr. Takashi MAKI)*
11:10-11:30	*Japan: Atmospheric Environment Modeling at Kyushu University* *(Dr. Itsushi UNO, Dr. Zhe WANG)*
11:30-11:50	*Korea: Current status of dust/haze monitoring and forecasting in KMA* *(Mr. Hee Choon LEE)*
11:50-12:10	*China: 2016 Annual Report on Monitoring of Dust and Sandstorm in China (Mr. Liang LI and Ms. XIA Zhang)*
12:10-12:30	*China: Analysis of a typical severe DSS event in 2016* *(Mr. Wei WANG)*
12:30-12:45	*discussions*

13:00-14:00	-- Lunch --

Session Ⅳ Report From the Countries on DSS Events **Chair: Mr. Hee Choon LEE (*Korea*)**	
14:00-14:20	*Korea: Analysis of model (ADAM3) and observation data in DSS2016 cases (Dr. Yun Kyu LIM)*
14:20-14:40	*Japan: Asian dust observations by AD-Net, a lidar network in East Asia (Dr. Atsushi SHIMIZU)* *(*) including 2017 DSS events for WG1 joint studies*
14:40-14:50	*discussions*

14:50-15:00	-- Coffee break --
Session Ⅴ Report From the Countries : Free themes **Chair: Mr. Liang LI (*China*)**	
15:00-15:20	*China: The influence of dust and sandstorms on ambient air quality in urban China -A new way to identify DSS influence (Ms. Jingyan LI)*
15:20-15:40	*Korea: On the Chemical Composition Change according to Pathway of week Asian dust during June 2015 (Dr. Sang Sam LEE)*
15:40-15:50	*discussions*
15:50-16:00	-- Coffee break --
Session Ⅵ Discussions on future cooperation and next steps **Chair: Ms. Yayoi HAYASHI (*Japan*)**	
16:00-16:15	*Japan: A proposal to review the current Action Plan (2016-2019) and thoughts for the next Action Plan (2020-) (by Mr. Nobuyuki KONUMA)*
16:15-16:30	*Korea: A proposal to thoughts for next Action Plan* *(Dr. Sang Boom RYOO)*
16:30-16:45	*discussions*

18:30-20:00	-- Reception Dinner --

■ Day 2 (16th November)

Session Ⅶ Summary **Chair: Dr. Masataka NISHIKAWA (*Japan*)**	
9:30-11:00	Meeting Summary and Discussions
11:00-11:20	Closing Remarks *Korea: Dr. Sang Boom RYOO, National Institute Meteorological Sciences of KMA* *China: Mr. Liang LI, China National Environment Monitoring Center* *Japan: Mr. Nobuyuki KONUMA, Ministry of the Environment*

■ Field trip (16th November) : Site visit to Shinjuku Lidar station

13:30	Take a metro "Shin Toshi-line" (approx. 10 min.) *(Ikebukuro station – Shinjuku Sanchome station)*
14:00	Visit to Shinjuku Lidar station (approx. 30 min.)
15:00	Return to Ikebukuro by metro

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List of Participants

China

Mr. Liang LI, Senior Engineer, Ambient Air Monitoring DEPT., China National Environment Monitoring Center, Ministry of Ecology and Environment, P. R. China

Ms. Xia ZHANG, Senior engineer, Ambient air quality monitoring department, China National Environment Monitoring Center, Ministry of Ecology and Environment, P. R. China

Mr. Wei WANG, Engineer, Ambient air quality forecast division, China National Environment Monitoring Center, Ministry of Ecology and Environment, P. R. China

Ms. Jingyan LI, Engineer, Ambient Air Quality Monitoring Department, China National Environmental Monitoring Centre, Ministry of Ecology and Environment, P. R. China

Japan

Mr. Tetsuya TAKAZAWA, Director, Air Environment Division, Environmental Management Bureau, Ministry of the Environment

Mr. Nobuyuki KONUMA, Deputy Director, Air Environment Division, Ministry of the Environment

Mr. Kazuyuki UEO, Deputy Director, Air Environment Division, Ministry of the Environment

Dr. Masataka NISHIKAWA, Director, Environmental Safety Center, Tokyo University of Science

Dr. Nobuo SUGIMOTO, Fellow, Center for Environmental Measurement and Analysis, National Institute for Environmental Studies (NIES)

Dr. Itsushi UNO, Professor, Research Institute for Applied Mechanics, Kyushu University

Dr. Zhe WANG, Assistant Professor, Research Institute for Applied Mechanics, Kyushu University

Mr. Takashi MAKI, Head, 1st laboratory, Atmospheric Environment and Applied Meteorology Research Department, Meteorological Research Institute (MRI)

Dr. Atsushi SHIMIZU, Senior Researcher, Center for Environmental Measurement and Analysis, National Institute for Environmental Studies (NIES)

Mr. Yasushi HIEDA, Secretariat (Overseas Environmental Cooperation Center (OECC))

Ms. Yayoi HAYASHI, Secretariat (OECC)

Ms. Masae SUMIKOSHI, Secretariat (OECC)

Mr. Yu KUDO, Secretariat (OECC)

Korea

Dr. Sang Boom RYOO, Director, Environmental Meteorology Research Division, National Institute of Meteorological Sciences, Korea Meteorological Administration

Dr. Sang Sam LEE, Senior Researcher, Environmental Meteorology Research Division, National Institute of Meteorological Sciences, Korea Meteorological Administration

Dr. Yun Kyu LIM, Scientific Researcher, Environmental Meteorology Research Division, National Institute of Meteorological Sciences, Korea Meteorological Administration

Mr. Hee Choon LEE, Senior Researcher, Environmental Meteorology Research Division, National Institute of Meteorological Sciences, Korea Meteorological Administration