

# **Summary of the Tenth Meeting of Working Group I for Joint Research on Dust and Sand Storms Lanzhou, 8<sup>th</sup> -11<sup>th</sup> November 2017**

1. The tenth 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 Lanzhou Ningwozhuang Hotel, Lanzhou, Gansu, China from 8<sup>th</sup> -11<sup>th</sup> November, 2017. Representatives from China, Japan and Korea participated in this meeting (Annex1: List of participants).
2. In Session One chaired by Mr. Yalin Wang Deputy Director General of Ministry of Environmental Protection of China, he delivered opening remarks and warmly welcomed to the participants. Then Dr. Liang Li, Senior Researcher of China National Environmental Monitoring Center (CNEMC), introduced the agenda of the meeting, which was adopted by all participants. All participants took a moment to officially introduce themselves to each other.
3. In Session Two chaired by Dr. Sang Boom Ryoo, Director of Environmental Meteorology Research Division of National Institute of Meteorological Sciences/Korea Meteorological Administration (NIMS/KMA), he made a presentation on “Overviews of the 9<sup>th</sup> Meeting of WG I for Joint Research on DSS”. In his presentation, he summarized the 9<sup>th</sup> Meeting of WG I and also introduced other related meetings such as the 2nd Joint Workshop (Feb. 16, 2017 in Seoul, Korea), the 11<sup>th</sup> SCM (Feb. 17, 2017 in Seoul, Korea), the 12<sup>th</sup> TDGM (Apr. 24, 2017 in Suwon, Korea) and the 19<sup>th</sup> TEMM (Aug. 24-25, 2017 in Suwon, Korea).
4. Mr. Yu Kudo, Researcher of Overseas Environmental Cooperation Center of Japan (OECC), made a presentation on “Current Posting Status about the Research Results to SOLA”. SOLA was chosen as the joint publication of research results in the 7<sup>th</sup> Meeting of WG I, and until now SOLA received 6 research papers from the WG1 experts. 5 papers had been accepted and been published in SOLA Vol. 13 (2017). The submission of the paper was closed on Nov. 9, 2017. Accepted papers will be compiled and be distributed at 12<sup>th</sup> Steering Committee Meeting for Joint Research on DSS.
5. Dr. Sang-Sam Lee, Researcher of NIMS/KMA, made a presentation on the current status of DSS2015 data sharing. According to his report, several data were newly added, for example, OPC (2 sites) from Korea, and single scattering albedo (SSA), refractive indices, and size distribution of SKYNET (6 sites) and POPC (2 sites) from Japan. He emphasized the availability of web-hard (<http://www.webhard.net>) to obtain the useful data and expressed his thanks to all participating countries for sharing their data.
6. Dr. Liang Li, CNEMC, made a presentation on DSS monitoring in China 2015. According to his report, the number of days that DSS occurred in China in 2015 is 46 days. The accumulative number of days that air quality exceeded the standard is 303 days in 2015, an increase of 12.2% over the same period of year 2014. The climate factor is conducive to dust and sand storms in 2015 in China.
7. In Session Three chaired by Mr. Yasushi Hieda, Principal Researcher of OECC, the Study on DSS Monitoring and Modeling from Japan was reported by Mr. Takashi Maki, Head of 1<sup>st</sup> Laboratory of

Meteorological Research Institute/Japan Meteorological Agency (MRI/JMA). According to his report, MASINGAR mk-2 could capture 2015 DSS events qualitatively. More data near dust source region, not only dust concentrations and meteorological data but also land surface related data, are required to improve dust emission processes of the model. JMA has introduced higher resolution (40km) version of the model mk-2 since Feb. 2017. The prediction scores are dramatically improved. JMA operates Himawari-8 since July 2015. Himawari-8 could continuously monitor dust storm at wide area. And also, MRI/JMA has developed data assimilation system for the satellite data.

8. Mr. Hee Choon Lee, Senior Researcher of NIMS/KMA, made a presentation on “Current status of operational dust and haze model in KMA”. He introduced the operational dust and haze model called ADAM2-Haze. He also presented about the data assimilation with PM<sub>10</sub> data observed in China and Korea. In addition he gave a future plan on the data assimilation with satellite-based AOD and ensemble-based assimilation system in Korea.
9. Ms. Lili Zhu, Engineer of CNEMC, made a presentation on “Modelling forecast of pollutant in dust weather in China”. In her presentation, the numerical forecast system NAQPMS was introduced, and a DSS case (Mar. 27- Apr. 2, 2015) was studied. The results showed that NAQPMS generally well simulated the observed heavy dust and pollution episodes, and observed coarse mode NO<sub>3</sub> and SO<sub>4</sub> are mainly coming from heterogeneous reactions of dust with HNO<sub>3</sub> and SO<sub>2</sub>, resulting in significant internal mixing of dust and pollutants.
10. Mr. Xiaohong Li, Vice Chief of Gansu Province Environmental Monitoring Center, made a presentation on “Dust Weather Monitoring in Gansu Province”. The capacity building and maintenance of DSS monitoring network in Gansu province, as well as application of DSS monitoring data, was introduced. Some suggestions regarding DSS monitoring were put forward.
11. Mr. Hao Zheng, Assistant Engineer of Shaanxi Environmental Monitoring Center, made a presentation on “Dust and Sandstorm Monitoring in Shaanxi Province”. He introduced the DSS Monitoring Network of Shaanxi Province, and overall condition of DSS including major sources, transport route, frequency of occurrence in different seasons, as well as its impact on air quality.
12. Mr. Duo Wang, Engineer of Liaoning Environmental Monitoring and Experiment Center, made a presentation titled “Dust storm monitoring of Liaoning Province”. In his presentation, he introduced the current DSS monitoring status and application of monitoring data. One case of DSS heavy pollution in Liaoning Province was studied in terms of air quality, transport route and meteorological conditions. He also made some suggestions regarding DSS monitoring and research.
13. Ms. Yu Gu, Senior Engineer of Environmental Monitoring Station of Inner Mongolia, made a presentation titled “Monitoring and Analysis of Dust Storm in Inner Mongolia”, in which she introduced the background, history and current status of DSS monitoring in Inner Mongolia. A severe DSS pollution case was also showed in her presentation.
14. In Session Four chaired by Dr. Sang-Sam Lee, NIMS/KMA, Dr. Atsushi Shimizu, Senior Researcher of National Institute for Environmental Studies of Japan (NIES), introduced Asian dust observations based on AD-Net (Asian dust and aerosol lidar observation network) in East Asia. AD-Net observed three dimensional distribution of Asian dust continuously in 2016 and 2017. AOD of dust particles averaged in Japan indicated negative trend (-2.5%/year) in recent 10 years. Daily dust density was estimated and

provided for epidemiological studies. Introduction of ceilometer into AD-Net is considered, and Ministry of the Environment of Japan (MOEJ) has a plan to deploy a ceilometer in Iran to monitor dust storms.

15. Ms. Yaqian Liu, Assistant Engineer of Qinghai Environmental Monitoring Center, made a presentation titled “Introduction of Sandstorm Monitoring work in Qinghai”. She made a brief introduction of sandstorm monitoring stations and analysis of DSS monitoring data. She concluded that sandstorm of Qinghai is not only affected by local dust source, but also affected by long-distance transport.
16. Dr. Yun-Kyu Lim, Researcher of NIMS/KMA, made a presentation titled “Analysis and simulation result of DSS2015”. He explained the feature of DSS2015 cases at Korea using not only the observation data but also the numerical model (ADAM). And to improve the predictability of the model, he mentioned that it is necessary to upgrade the dust emission algorithm based on the near real-time three-dimensional observation data.
17. Mr. Satoshi Watanabe, Assistant Manager of MOEJ, made a presentation titled “Case Study of DSS event in Japan”. MOEJ has analyzed characteristics of DSS over Japan and their change since 2002. Case study of an observed DSS event showed a relation with DSS/Haze observation points, weather map, generation status of sand storm in the continent, back trajectory from observation points and sulfate ion concentration at observation points.
18. Ms. Qiong Ma, Assistant Engineer of Lanzhou Environmental Monitoring Station, made a presentation on “Monitoring and Forecasting of dust weather in Lanzhou”. The dust weather in Lanzhou is the result of the interaction of regional environment, geographical location and meteorological conditions. Enlargement of the vegetation coverage in the local and upstream areas can effectively reduce the concentration and frequency of dust.
19. Dr. Liang Li, CNEMC, made a presentation titled “Conference Optimization of the WG I Meeting of DSS”. He suggested and discussion was made on the possibility to fix the date of the WG I meeting of each year, to determine the date of WG I meeting early (at least 3 months a prior) for visa application, to reduce the related meetings, to prepare the draft of summary of WG I meeting in advance, to designate SOLA as the journal to submit WG I research results, and to hire interpreter for WG I meeting. He also confirmed that the submission to the journal is not compulsory.
20. In Session Five chaired by Dr. Sang-Sam Lee, NIMS/KMA, discussion was made on the detailed milestones for mid-term action plan (2015-2019). It was decided that the data for the DSS event (Mar. 2-12, 2016; Apr. 20-30, 2016; and May. 4-14, 2016) will be shared by the participating countries. The countries will upload the data about the above suggested period to the data sharing website by the end of June, 2018. Dr. Sang Boom Ryoo, NIMS/KMA, introduced information on the web-portal site ([http://eng.nmc.cn/sds\\_was.asian\\_rc/](http://eng.nmc.cn/sds_was.asian_rc/)), operated by China Meteorological Agency (CMA), to share real time DSS model outputs. Enhancement of data sharing was discussed and encouraged among related countries in order to enrich the joint research.
21. Before closing, it was announced that the 11<sup>th</sup> meeting of WG I will be held in Japan. As the host country of the next WG I meeting, Japan will propose the date and venue of the meeting and timeline for preparing agenda and meeting materials more than 6 months before the meeting. Current candidate of the date of the meeting is the first or second week of Nov, 2018. Japan as the next host country suggested that English is common language in the meeting but, if necessary, Japan will prepare interpreters at own

expense according to requests from the other countries to make the efficient communications in the meeting.

**The 10<sup>th</sup> Meeting of Working Group I Joint Research on Dust and Sand Storms**

**Lanzhou, China**

**(8 November - 11 November , 2017)**

**List of Participants**

<b>Name</b>	<b>Nationality</b>	<b>Organization</b>	<b>Position</b>	<b>Tel/ Email</b>
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# The Agenda of The 10<sup>th</sup> Meeting of Joint Research on Dust and Sand Storms among China, Japan And Korea

**Date:** November 8th(Wed.) -11th(Sat.), 2017

**Venue:** Ningwozhuang Hotel Natatorium, Lanzhou, Gansu Province, China

**Host:** China National Environmental Monitoring Center , MEP of China

## Day 1 (November 8)

**Meeting Registration and Accommodation.**

**Ningwozhuang Hotel Lanzhou, Gansu Province, China**

## Day 2 (November 9)

**Session I Opening Remarks**

**Room:** Small Hall NO.1 building, Ningwozhuang Hotel

**Chair:** Mr. Li Liang (China National Environmental Monitoring Center/MEP, China)

<b>Time</b>	<b>Activities</b>
<b>9:00-9:30</b>	<b>Participants Receive Conference Materials (Prepare)</b>
<b>9:30-9:40</b>	<b>Opening Remarks(<i>China</i>)  Chair: Mr. Wang Yalin (Ministry of Environmental Protection of China)</b>
<b>9:40-9:45</b>	<b>Introduction of Participants</b>
<b>9:45-9:50</b>	<b>Adoption of the agenda</b>
<b>Session II Looking Back at Discussion and Activities</b>	



**Room: Small Hall NO.1 building, Ningwozhuang Hotel**

**Chair: Mr.Sang Boom Ryoo (National Institute of Meteorological Sciences/KMA, KOREA)**

<b>Time</b>	<b>Activities</b>
<b>9:50-10:10</b>	<i>Korea:Overviews of the 9<sup>th</sup> Meeting of WG(I) for Joint Research on DSS (Dr. Sang Boom RYOO)</i>
<b>10:10-10:30</b>	<i>Japan:Current Posting Status about the Research Results to SOLA (Yu Kudo)</i>
<b>10:30-10:50</b>	<b>Break</b>
<b>10:50-11:10</b>	<i>Korea:Current Status of DSS Data Sharing (Dr. Sang-Sam LEE)</i>
<b>11:10-11:30</b>	<i>China:China: DSS monitoring in China 2015 (Mr.Li Liang)</i>
<b>11:30-13:30</b>	<b>Lunch (Room: To Be Decided)</b>
<b>Session III The Study On DSS Monitoring and Modeling From Each Country</b>	
<b>Room: Small Hall NO.1 building, Ningwozhuang Hotel</b>	
<b>Chair: Yasushi HIEDA (Overseas Environmental Cooperation Center, JAPAN)</b>	
<b>14:00-14:20</b>	<i>Japan: The Study on DSS Monitoring and Modeling from Japan (Mr.Takashi Maki)</i>
<b>14:20-14:50</b>	<i>Korea: Current Status of Operational Dust and Haze Model (ADAM2-Haze) In KMA (Mr. Hee Choon LEE)</i>

<b>14:50-15:10</b>	<i>China: modeling forecast of pollutants in dust weather (Ms. Zhu Lili)</i>
<b>15:10-15:30</b>	<i>China: The Report on dust weather monitoring in GanSu Province (Mr.Li Xiaohong)</i>
<b>15:30-15:50</b>	<b>Break</b>
<b>15:50-16:10</b>	<i>China: DSS Monitoring in Shaanxi Province (Mr. Zheng Hao)</i>
<b>16:10-16:30</b>	<i>China: Study on Sandstorm Monitoring in Liaoning Province (Mr.Wang Duo)</i>
<b>16:30-16:50</b>	<i>China: DSS Monitoring in Inner Mongolia (Ms. Gu Yu)</i>
<b>16:50-17:00</b>	<b>Discussion and Photo</b>

**Day3 (November 10 )**

<b>Session IV Report From the Countries on DSS Events</b>	
<b>Room: Small Hall NO.1 building, Ningwozhuang Hotel</b>	
<b>Chair: Dr.Sangsam Lee (National Institute of Meteorological Sciences/KMA, KOREA)</b>	
<b>Time</b>	<b>Activities</b>
	<b>Reports From Each Country</b>
<b>9:00-9:20</b>	<i>Japan: Asian Dust Observations Based on AD-Net Lidar Network in East Asia (Atsushi Shimizu)</i>
<b>9:20-9:40</b>	<i>China: Introduction of Sandstorm Monitoring work in Qinghai(Mr.Zhao Xudong)</i>
<b>9:40-10:00</b>	<i>Korea: Analysis and Simulation Results of DSS2015 By</i>

	<i>NIMS/KMA (Dr. Yun-Kyu LIM)</i>
<b>10:00-10:20</b>	<b>Break</b>
<b>10:20-10:40</b>	<i>Japan: Case Study of DSS event in Japan (Satoshi WATANABE)</i>
<b>10:40-11:00</b>	<i>China: Monitoring and forecasting of dust weather in Lanzhou (Ms. Ma Qiong)</i>
<b>11:00-11:20</b>	<i>Conference Optimization of the WG I Meeting of DSS (Dr. Li Liang)</i>
<b>11:20-11:30</b>	<b>Other Related Activities and Discussion</b>
<b>11:30-13:30</b>	<b>Lunch (Room: To Be Decided)</b>
<b>Session V Summary</b>	
<b>Room: Small Hall NO.1 building, Ningwozhuang Hotel</b>	
<b>Chair: Mr. Takashi MAKI (Meteorological Research Institute)</b>	
<b>Time</b>	<b>Activities</b>
<b>13:30-15:00</b>	<b>Meeting Summary and Discussion</b>
<b>15:00-16:00</b>	<b>Closing Remarks</b>

**Day4 (November 11 )**

**Checkout And Departure**