

WORLD METEOROLOGICAL ORGANIZATION

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COMMISSION FOR BASIC SYSTEMS
OPEN PROGRAMME AREA GROUP ON INTEGRATED OBSERVING SYSTEMS

INTER-PROGRAMME EXPERT TEAM ON SATELLITE UTILIZATION AND
PRODUCTS

ITEM: 7.1

THIRD SESSION

Original: ENGLISH

GENEVA, SWITZERLAND, 2-5 MAY 2017

SCOPE-NOWCASTING

Sand and Dust Monitoring in RA II (Pilot Project 4)

(Submitted by Xiang Fang, CMA)

Summary and Purpose of Document

This document reports the main progress of SCOPE-Nowcasting Pilot Project 4 in developing the aerosol retrieval algorithm over ocean, testing several dust index with geostationary satellite data, and coupling the satellite and the surface observations for model.

ACTION PROPOSED

The second session is invited to:

- (a) Provide comments for next stage work.
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DISCUSSION

Introduction

1. Improvement on AOD algorithm

Recently, CMA has developed the Aerosol Optical Depth(AOD) product over ocean, and combined it with the AOD over land to obtain the AOD image in the full-disk region. All quasi-realtime data are published on the website (<http://10.24.34.188:8080/>).

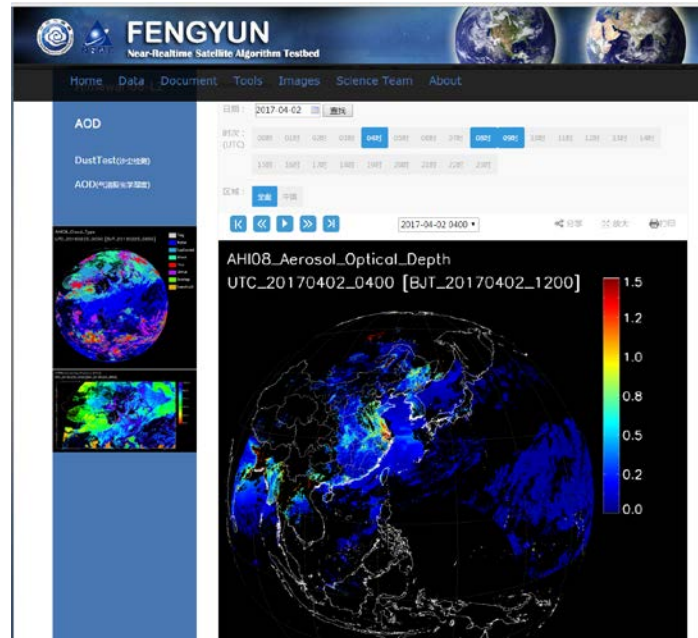
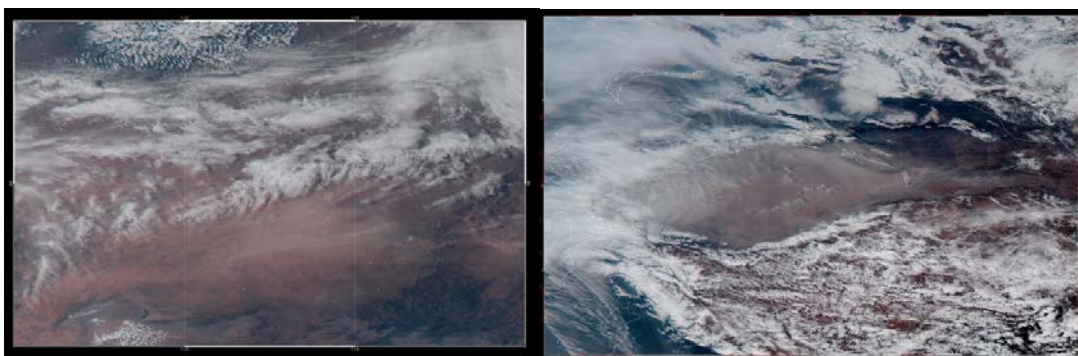


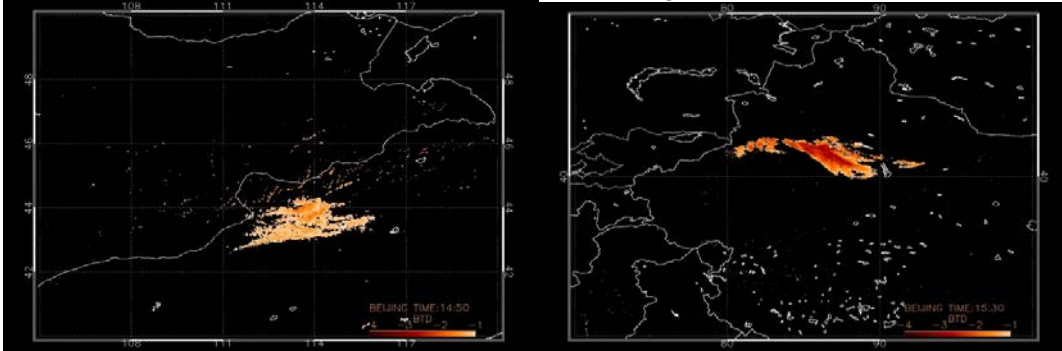
Figure 1 Aerosol optical depth over land and ocean in 04:50UTC on 2 April 2017

2. Development on dust index products

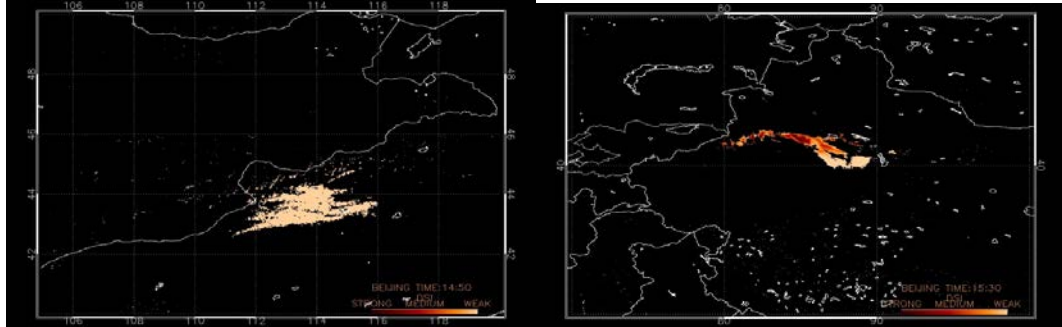
The Infrared Difference Dust Index (IDDI) are often used to detect the duststorm in arid and semiarid regions. CMA has produced the operational FY-2 IDDI dust product, and this method is applied to Himawari-8 and FY-4A. Other dust index products such as Brightness Temperature Difference (BTD) and Dust Storm Index (DSI) have been used in dust detection (Fig.2).



(a) RGB image at 06:50 (UTC) on 30 March 2016 b) RGB image in 07:30 (UTC) on 24 March 2017



(c) BTD at 06:50 (UTC) on 30 March 2016 (d) BTD at 07:30 (UTC) on 24 March 2017



(e) DSI in 06:50 (UTC) on 30 March 2016 (f) DSI in 07:30 (UTC) on 24 March 2017
 Figure2 The RGB images and the dust detection results on 30 March 2016 and 24 March 2017

3. Coupling the satellite and the surface observations

CMA has developed an algorithm coupling visibility of station and IDDI of satellite in the areas covered by clouds, which has been used in the data assimilation system of CMA operational regional dust forecast model (CUACE/Dust) (fig.3).

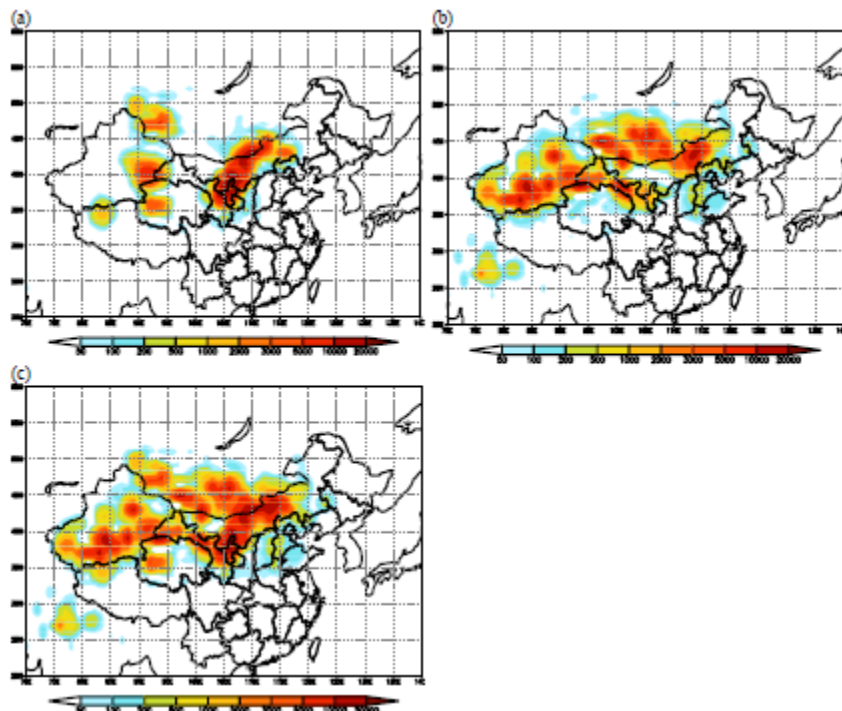


Figure 3 Analysis dust concentration results by using (a) only SDS_IDDI, (b) only visibility data, (c)

both SDS_IDDI and visibility data

4. Sharing and Publishing

As mentioned last year, exchange of dust products among Members in RA II should be established. CBS-16 acknowledged that RSMC-ASDF Beijing had complied with all mandatory functions in the revised Manual on the GDPFS (WMO-No. 485), and recommended that EC-69 gives the formal designation of RSMC-ASDF Beijing (RA II). The Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS) of RSMC-ASDF Beijing Web Portal (<http://eng.weather.gov.cn/dust/>) has been designed to allow users to access to the monitoring and forecast products, and the products from CMA NSMC such as FY-2E/VISSR IDDI, FY-3B/VIRR DII. FY2E IDDI is disseminated to RAII members via CMACast as well.

5. Work plan for next stage

Apply the AOD algorithm to FY-4A and provide operational product.

Provide a lecture or training course on dust and haze observations at AOMSUC-8.