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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Evidence of mineral dust altering cloud microphysics and precipitation" *by* Q.-L. Min et al.

Q.-L. Min et al.

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We thank Drori Ron for his comments.

From March 3 to March 10, 2004, there was a major dust outbreak from Western Africa across the Atlantic. The dust storm was observed by several satellites, ground stations, and by ship observations in the trans-Atlantic Aerosol and Ocean Science Expeditions (AEROSE) experiment. Although there were some fires along the storm track, aerosols were mineral dust with some smoke particles. Based Terra/MODIS retrieved aerosol optical depth (AOD) distribution (9:55 UTC on March 8, 2004), AODs in the coarse mode in the vicinity of the selected MCS were substantially higher than that in the fine mode. The ratios of the fine AOD to the total AOD ranged from 0.01 to 0.1. It directly demonstrates that the aerosol type was dominated by mineral dust (with some smoke). (sorry we can not upload figures in this response, but we can send it to you if your want

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it)

Additionally, we would like to show other FIVE independent evidences to illustrate our case is a dust case rather than a smoke case.

1) Evidences from Aqua/MODIS The picture taken by Aqua/MODIS on 03/08/2004 (shown in http://rapidfire.sci.gsfc.nasa.gov/gallery/?2004068-0308/Dust.A2004068.1430.8km.jpg) was recognized as a typical event of dust storm across Central and West Africa; by the MODIS Rapid Response System (http://rapidfire.sci.gsfc.nasa.gov; Image courtesy of MODIS Rapid Response Project at NASA/GSFC)

2) Evidence from GOES-12 The picture taken by GOSE-12 at 14:45 UTC on 03/08/2004 was recognized as a dust (http://www.osei.noaa.gov/Events/Dust/Africa_W/2004/DSTafr067_G12.jpg) event by the Operational Significant Event Imagery team (OSEI) at the NOAA Science Center in Suitland, Maryland. (http://www.osei.noaa.gov/, Image courtesy of OSEI, NOAA, NASA)

3) Evidence from NOAA-17 observation The picture taken by NOAA-17 at 10:48 UTC on 03/08/2004 was recognized as a dust (http://www.osei.noaa.gov/Events/Dust/Africa_W/2004/DSTafr068_N7.jpg) event by the Operational Significant Event Imagery team (OSEI) at the NOAA Science Center in Suitland, Maryland (http://www.osei.noaa.gov/, Image courtesy of OSEI, NOAA, NASA)

4) Evidence from METEOSAT-8 The picture taken by METEOSAT-8 at 12:00 UTC on 03/08/2004 (http://oiswww.eumetsat.org/WEBOPS/iotm/iotm/20040306_dust/2004_03_08_1200_RGB_03-02-01_lrg.jpg) was recognized as a typical case of Sahara dust outbreak across the Atlantic by the EMUSAT http://www.eumetsat.int/Home/index.htm, Image courtesy of EMUSAT)

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5) Evidence from AEROSE This event was observed by the trans-Atlantic Aerosol and Ocean Science Expeditions (AEROSE) experiment and was reported by Nalli et al. (2005); Nalli et al. (2006); and Morris et al. (2006).

Nalli, N. R., et al. (2005), Profile observations of the Saharan air layer during AEROSE 2004, Geophys. Res. Lett., 32, L05815, doi:10.1029/2004GL022028.

Nalli, N. R., et al. (2006), Ship-based measurements for infrared sensor validation during Aerosol and Ocean Science Expedition 2004, J. Geophys. Res., 111, D09S04, doi:10.1029/2005JD006385.

Morris, V., P. Clemente-Colón, N. R. Nalli, E. Joseph, R. A. Armstrong, Y. Detrés, M. D. Goldberg, P. J. Minnett, and R. Lumpkin (2006), Measuring Trans-Atlantic Aerosol Transport From Africa, Eos Trans. AGU, 87(50), doi:10.1029/2006EO500001.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 18893, 2008.