

Japan Geoscience Union Meeting 2011

(May 22-27 2011 at Makuhari, Chiba, Japan)

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AAS021-P16

Room:Convention Hall

Time:May 23 16:15-18:45

Estimation of radiative impact of soil dust by using WRF/Chem

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We are now trying to include mineral dust aerosols in the model, because mineral dusts have a large impact on the radiation in East Asia in spring. In the present study we use WRF/ARW (Advanced Research WRF) version 3.1.1, and the gaseous and aerosol chemistry is based on RADM2 and MADE/SORGAM, respectively. Dust flux is estimated based on Shaw et al. (2008), and slightly modified to adapt to the East Asia following to Uno et al. (2004). Gravitational settlement of mineral dust is based on GOCART (Goddard Chemistry Aerosol Radiation and Transport) model. Landuse is based on the MODIS land-use data. For the evaluation of the model, we conducted calculation for spring 2006 and compared with ground-based observation in Beijing. The model well captured the increase of PM10 during 17-19 April and 22-24 April, and it was estimated the most part of this PM10 particles were soil dust.

The impact of soil dust on shortwave radiation was also estimated by the model, and found 15W/m² of decrease was caused by the soil dust during the dust event.

Keywords: Atmospheric Chemistry, soil dust, East Asia, shortwave radiation, transport