Abstract Details

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Title: Simulation of the 2002 ~ 2003 Asian Dust Incursions over Taiwan

Abstract:

A numerical modeling system was developed to accurately simulate t deflation of dusts into the atmosphere and subsequent transport in th Asia region. This modeling system is used as part of an early-warning of for the Environmental Protection Administration of the Republic of for health alert to the public regarding to air quality, as well as to pro lead-time for operations of a field experiment conducted in Taiwan du Spring of 2001. The modeling system consists of three major compor meteorological module, a dust deflation module, and a transport mod widely used Fifth-Generation PSU/NCAR Mesoscale Meteorological Mo (MM5) is applied to provide regional meteorological fields. The dust d module we adopted follows the scheme of Wang et al. (2000), which describe the deflation of dust into the atmosphere in terms of the sur type, friction velocity and relative humidity near the surface, as well a synoptic pattern. Dust transport in the regional scale is calculated usi Taiwan Air Quality Model (TAQM), which was a modified version of the Regional Acid Deposition Model (RADM) developed by the US Nationa Precipitation Assessment Program. In this presentation we discus the simulations of Asian dust storms occurred during the spring of 2002 a 2003, with particular focus on the events of dust incursion over Taiwa general characteristics of all dust incursion events are summarized, ir the source locations, transport routes in three dimension, distribution patters, traveling time and incursion duration. We found significant differences in these characteristics between the two years, and the m cause of which is a change in regional climate patterns. Two of the ev are analyzed in detail to give a complete picture of the three dimensi transport patterns. The model performance is evaluated against a cou other operational dust forecast models, and our model is superior in i capability of forecasting for the Taiwan area.

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