Geophysical Research Abstracts,
Vol. 10, EGU2008-A-00933, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-00933
EGU General Assembly 2008

Sources sink from north African dust cycle in the Mediterranean region

B. Douaiba (1), A. Abbess (1), A. Khorsi (1), P. Louka (2), L. Aidaoui (1), G. Kallos (2)

(1) University of Science and Technology, institute of Mechanics ORAN, Algeria

(2) University of Athens, School of Physics

hakou_djawed2005@yahoo.fr / Phone 213 78 33 18 12

Saharan desert of North Africa is the most important natural source of dust in atmospheric transport. Its impacts on climate and environment have various aspects and need to be better understood. The transport of Saharan dust towards Mediterranean and Europe has certain impacts like in air quality, water cycle, marine ecosystems etc.

The production, transport and deposition of dust in Sahara and sub-Saharan northern Africa is complex. Atmospheric dust deposition to the Earth's surface depends on location, season and particle size, mainly concentrated in the coarse fraction. The removal efficiency is size dependent. Dust particles are usually dry when first lofted into the atmosphere, but the moisture content of dust cloud increases, and so dust particles become more effective at scavenging as transport distance increases. Small dust particles, typical of long-distance transported dust, are most effective at scavenging. The distance travelled by dust particles depends upon many factors, including wind speed and turbulence, dust grain characteristics and their settling velocities, the latter determined by the mass and shape of each particle. For sands and coarse silts the gravitational settling alone (dry deposition) determines the sedimentation velocity, while for clay the lifetime in the atmosphere is mainly controlled by wet deposition and turbulent mixing.

Clouds and precipitation plays a critical role in the removal of atmospheric dust pollu-

tants via wet deposition processes. These removal processes can proceed first with the cloud droplet formation via several mechanisms including heterogeneous nucleation. Thus dust remains one of the most challenging species to model in order to understand the mineral dust sources and sinks. Reproducing this knowledge in models is an important test of modelling skill at predicting future dust deposition and related climate change.

This paper presents a study of the relationships between the meteorological conditions and dust depositions phenomena in both modes, dry and wet deposition in the Mediterranean region from the Saharan regions of North Africa during two dust events namely: case I (01/03/04 - 06/03/04), case II (29/05/05 - 03/06/05), that have been analysed and their major characteristics have been

discussed. This analysis has been performed with the aid of the SKIRON modeling system of the University of Athens.