



1 Modelling mineral dust sources; present knowledge and limitations

B Marticorena

LISA, UMR CNRS 7583, Universites Paris 7-Paris12,

Centre Multidisciplinaire de Creteil (CMC), 61 avenue du General de Gaulle, F-94010 Creteil cedex, France

(marticorena@lisa.univ-paris12.fr / Fax : 33 1 45 17 15 64 / Phone : 33 1 45 17 65 69)

Mineral dust is a major contributor to the atmospheric aerosol burden. The global annual input of mineral aerosols into the atmosphere is estimated to represent about half of the annual total emissions of tropospheric aerosols by both natural and anthropogenic sources.

Dust emissions are strongly dependent on climatic parameters such as wind speed or precipitation, which could change in the context of the global change. Moreover, dust emissions are very sensitive to the surface features (roughness and vegetation cover, soil grain-size distribution, soil texture. . .). In addition, the increasing human pressure exerted on semi-arid lands could lead to an increase of the atmospheric dust content. Beside satellite observations, which provide relevant pictures of the present dust sources, transport and atmospheric load, models of the dust cycle must be developed to link observations and processes and to predict what could be the future dust cycle.

Dust emissions models try to describe at the relevant scale the physical processes acting at the interface between the atmospheric and the surface. One of the key issues is to estimate the erosion threshold wind friction velocity that controls both the frequency and the intensity of the dust emissions. This threshold depends on various surface

properties among which surface roughness, vegetation cover, soil moisture and soil texture are the most important. Soil properties (in situ size distribution and texture) control the intensity of the dust emissions.

The presentation will illustrate how the dust emission processes are represented in dust emission model, how the surface parameter controlling the dust emissions can be retrieved for different desert and some illustrations on the resulting uncertainties of the dust emissions simulated for African or Asian deserts.