Geophysical Research Abstracts, Vol. 8, 03941, 2006
SRef-ID: 1607-7962/gra/EGU06-A-03941

Provenance of present-day aeolian dust collected off NW Africa inferred from a multiproxy study combining grain size, chemistry, mineralogy, *n*-alkanes, C and N isotopes and satellite observations

Jan-Berend Stuut (1), Matthias Zabel (1), Gaute Lavik (2) Enno Schefuß (3), & Ralph Schneider (4)

(1) Research Center Ocean Margins (RCOM), Universität Bremen, Klagenfurterstrasse 2,

28334 Bremen, Germany e. jbstuut@rcom-bremen.de, t. +49-421-218 65657

(2) Max Planck Institute for Marine Microbiology, Celciusstrasse 1, 28359 Bremen, Germany

(3) Department of Marine Chemistry and Geochemistry, Woods Hole Oceanographic

Institution, Woods Hole, Massachusetts, USA.

(4) Institut für Geowissenschaften, Christian-Albrechts-Universität zu Kiel,
Ludewig-Meyn-Strasse 10, 24118 Kiel, Germany.

Atmospheric dust samples collected along a transect off the West African coast during February and March 1998 have been investigated using a suite of analyses including grain-size distribution, mineralogy, major-element chemistry, n-alkanes, and C and N isotopes. On the basis of these data the samples were grouped into sets of samples that most likely originated from the same source area. In addition, shipboard collected atmospheric meteorological data, modelled four-day back trajectories for each sampling day and location, and the Aerosol Index data of the Total Ozone Mapping Spectrometer for the time period of dust collection were combined and used to reconstruct the sources of the dust samples. On the basis of these data we were able to determine the provenance of the various dust samples. It appears that the bulk of the wind-blown sediments that are deposited in the proximal equatorial Atlantic ocean are transported in the lower-level ($\sim$ 900 HPa) NE trade-wind layer, which is a very dominant feature North of the Intertropical Convergence Zone (ITCZ). However, South of the surface

expression of the ITCZ, down to 5˚S, where surface winds are from the South and West, we still collected sediments that originated from the North and East, carried there by the NE trade-wind layer, as well as by easterly winds from higher altitudes. The fact that the size of the wind-blown dust depends not only on the wind strength of the transporting agent but also on the distance to the source, as well as the vertical distance the particles have travelled hampers a direct comparison of the dust's size distributions and measured wind strengths. However, comparison between aeolian dust and terrigenous sediments collected in three submarine sediment-traps off the West coast of NW Africa shows that knowledge of the composition of aeolian dust is a prerequisite for the interpretation of palaeo-records obtained from sediment cores in the equatorial Atlantic.