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Seasonal variability 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

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Atmospheric dust samples collected along a transect off the West African coast aboard research vessels during different sampling campaigns, during different seasons, 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, and their seasonal variability.

It appears that the bulk of the wind-blown sediments that are deposited in the proximal equatorial Atlantic ocean is 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.

We conclude that –although it is a major advantage to have a relative control on the stability of the dust-source areas- it is difficult to express the size of the aerosols in absolute wind speed since the latter depends on 1) the strength of the transporting agent, 2) the distance to the source, as well as 3) the vertical distance the particles have travelled.

Finally, after comparison between atmospheric dust and terrigenous sediments collected in submarine sediment traps off the West coast of NW Africa, we conclude 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.