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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Variability of mineral dust deposition in the western Mediterranean basin and South-East of France" *by* J. Vincent et al.

Anonymous Referee #1

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The paper by Vincent et al summarizes the results of a monitoring study on atmospheric deposition in the Western Mediterranean, covering a south to north transect from Lampedusa to continental France.

General comment:

The authors measured weekly deposition samples by using a new automatic device (CARAGA) able to collect and filter atmospheric deposition onto filters. They performed the study at 5 different locations (4 islands and one continental site, all regional background), during almost three years but with several gaps, and they focused only in the insoluble fraction (mostly attributed to mineral dust). In their study the authors display a North to South increasing deposition gradient related to the higher impact of Saharan dust towards the South, as expected from airborne measurements. Furthermore, they

investigated when (in seasonal terms) deposition amounts are more intense at each location, and from where the dust is dominant (in terms of source regions). The study of atmospheric deposition is essential to know the transfer of nutrients and pollutants to waters, sediments and ecosystems, and therefore a study of these characteristics is necessary.

Specific comments:

-The authors only considered the insoluble fraction, which is not a criticism by itself, but given the effort realized in setting up the network it would be desirable also to measure the soluble fraction, especially concerning the N deposition.

-They did not perform any chemical speciation study, and consequently the transfer of specific nutrients contained in mineral dust such as Fe and P is unknown. The availability of this desirable information would add an enormous value to this work.

-The design of the experimental network is adequate in terms of geographical distribution but one of the sites (Frioul) is really close to a big populated region (Marseille city and its industrial surroundings). Actually, it seems that a constant mineral dust input (most probably reflecting the influence of that urban area) occurs (see Fig. 3), which makes that place not fully comparable with the others (but at the same time interesting).

-It would be nice to find (even in the supplement) a comparison between airborne measurements (dust in PM10 or TSP, as in some works cited in the paper) and deposition fluxes where both measurements are available (namely Lampedusa, Mallorca, Corsica).

-Data coverage is good (over 77%) but important gaps are evident at specific locations, putting in risk some of the conclusions, especially those concerning seasonal patterns and source regions of dust. I encourage the authors to discuss deeper on this when appropiate.

Interactive comment on Atmos. Chem. Phys. Discuss., 15, 34673, 2015.