

Interactive comment on “Physical and chemical properties of deposited airborne particulates over the Arabian Red Sea coastal plain” by Johann Engelbrecht et al.

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Anonymous Referee #3

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The paper presents and analyzes the mineralogical, physical and chemical composition of dust deposited samples at six sites on the KAUST campus. KAUST is located on the Red sea coastal plain of Saudi Arabia. Monthly samples were collected between December 2014 and December 2015. The monthly deposition trends were compared to visibility and sun photometric measurements and to previous mineralogical analysis of soil samples from nearby dust sources. The paper concludes that dust deposits along the Red Sea coast are a mixture of dust emissions from local soils and soils imported from distal sources.

As the authors mention in the abstract and the paper, the type of information obtained has no precedent in the region and can be useful for modelers and other impact areas. This supports publication.

1. In order to make the data useful to others, the authors may include, not only the oxide data in the appendix, but also the mineralogical data and size distribution data. I believe this is the main reason for publication of this manuscript.

Authors Response: Particle size distribution plots of 12 deposition samples collected monthly at the KAUST campus throughout the 2015 period are added as Appendix A. The mineralogical data are added as a table in Appendix B. The chemical data tables are renumbered as Appendix C.

2. While the data will be useful, I find the paper itself overly descriptive. The paper presents the data and a preliminary exploratory data analysis from which it is difficult to extract new insights. The comparison with AERONET, visibility and meteorology is rather superficial. A good example of my argument is Figure 4, where the authors present humidity and temperature data but it is not very clear why they do so. The comparison with AERONET is performed with total AOD. It would have been more appropriate to filter the data by low Angstrom Exponent or use coarse mode AOD.

Authors Response: : This is discussed under items 27 and 29 of authors response to referee #1 comments.

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3. One of the main conclusions is that dust in the Red Sea is a mixture of dust from local soils and dust imported from distal sources, which is something that is already well-known; the paper makes no attempt to quantify the respective contributions. An additional concern that I have is the selection of the sites to measure dust deposition. It is not very clear what is the impact of local construction activities. The authors should make a clear statement in that respect.

Authors Response: Source apportionment is considered to be a further step in our research, to be documented in a following paper. As an approximation the sampler with the lowest deposition rate can be considered to have negligible or the least amount of local dust and sea salt. In the months of December 2014, January, April, March, June, July, and December 2015, the deposition rates at the four sites were similar, and considered to have no or negligible amounts of dust from local construction, campus roads, marine salt, or other particulates.

Other than that, I think that the paper is well written and well structured. I did not find minor errors or typos.

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