

Interactive comment on “INVENTORY OF AFRICAN DESERT DUST EVENTS IN THE NORTH-CENTRAL IBERIAN PENINSULA IN 2003–2014 BASED ON SUNPHOTOMETER-AERONET AND PARTICULATE MASS-EMEP DATA” by V. E. Cachorro et al.

Anonymous Referee #2

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The paper “Inventory of African desert dust events in the North-central Iberian peninsula in 2003-2014 based on sunphotometer-aeronet and particulate mass-emet data” by Cachorro et al., is an interesting paper dealing with a very timely and interesting topic: the dust presence over Southern Europe and its impact on PM measurements. There are some aspects however of the data analysis and discussion that should be improved for providing the readers with more robust results. My main comment is about the first criterion for selecting dust cases: a threshold on AOD. Firstly, the mean value of

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AOD is a mean for dust+ no dust cases, since cases including dust cases are within the dataset used for calculating the mean. Therefore the threshold mean + st dev selects by definition only extreme values, that at this stage could be dust or no dust cases. The same concept applies to the threshold on Angstrom exponent. There are many studies showing the occurrence of low dust AOD cases over Europe (example at network level Papayannis et al., 2008). Of course threshold criteria are always questionable but probably authors could improve the results considering seasonal threshold. About the threshold issue, the big question here is: the authors found a decreasing in the aod , i.e. this is a no stationary condition for this aerosol parameter and the threshold cannot be define in this way. The result here presented about the decreasing of dust cases is simply the consequence of the fixed threshold defined. The authors should consider the decreasing in AOD in the threshold application. Without taking into account the AOD trends results of the study would be compromised. My suggestion is defining a season by season threshold and reanalyzing data in view of this modification.

Minor comments are reported in the following. Line 134: "PMx sampling is typically ... " there are many cases in which the PMx is provided with high temporal resolution

Line 151: other papers combining columnar AOD and PMx measurements are available in literature, reviewing this paper I found very interesting the paper Boselli et al., Atm Env. which shows how cluster analysis in the aod/Angstrom space could be good for the dust identification with certain limit when this is compared to air mass analysis showing also that dust cases are very variable in AOD/Angstrom values.

Line 155: probably reliable is not the correct word here.

Line 222: Complete is here too much, sufficient, satisfying?

Line 233: are 5 day backtrajectories sufficient? Iberian peninsula is not so far away from African, but however there could be longer paths carrying dust from the desert.

Line 279-281: include references for these values

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Figure 4: this could be compared to AOD related just to dust layers as obtained by lidar observations available in literature.

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