

## ***Interactive comment on “The regime of desert dust episodes in the Mediterranean based on contemporary satellite observations and ground measurements” by A. Gkikas et al.***

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The manuscript intends to provide a climatological-like study of intense dust episodes over the Mediterranean Basin, mainly from a 7-yr time series of MODIS aerosol data completed by coincident observations (AERONET, PM10, OMI aerosol index).

Scientific Significance: Does the manuscript represent a substantial contribution to scientific progress within the scope of Atmospheric Chemistry and Physics (substantial new concepts, ideas, methods, or data)?

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I think that this paper provides interesting information on high dust episodes in the Mediterranean basin during a relatively long period and that this falls within the scope of ACP. According to me, it must be made clearer that the study specifically deals with intense dust episodes and not all desert dust episodes as suggested by the use of “desert dust (DD) episodes”: I therefore recommend the systematic use of the terminology “intense desert dust (IDD)”. Section 4.3 is not very convincing or informative and could be omitted.

Scientific Quality: Are the scientific approach and applied methods valid? Are the results discussed in an appropriate and balanced way (consideration of related work, including appropriate references)?

The manuscript is of unequal quality. There are weak points regarding statistics of data that should be carefully considered in the revision process. It looks also from Fig. 4 that MODIS has a strong positive bias in AOD compared to AERONET up to AOD values of 1, which impacts are not discussed. For instance, this is likely producing a significant overestimation of strong dust events. I recommend that AERONET are used to check at several places the consistency of strong and extreme dust episode occurrences by comparison to collocated MODIS data.

Presentation Quality: Are the scientific results and conclusions presented in a clear, concise, and well-structured way (number and quality of figures/tables, appropriate use of English language)?

I find the illustrations of very poor quality. Most figures are not readable in their present form. Figs 5-7 appear interpolated whereas this cannot be justified: those figures should be plotted using the same style as Fig. 8, showing individual pixels. I also believe that information provided should be completed with details on the number of observations per pixel, with maps of AOD+2sigma and AOD+4sigma thresholds...

In conclusion I think that a substantial revision of the manuscript is requested. Detailed comments are following in a separate file.

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