

Interactive comment on “The representation of dust transport and missing urban sources as major issues for the simulation of PM episodes in a Mediterranean area” by E. Flaounas et al.

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Author comment :

We would like to thank both reviewers for their comments and for helping us improve our paper.

The main comments posted on this paper converge on the need to set our work in the context of previous studies and to highlight the innovating aspect of our results. Indeed, many works (as listed by reviewer #1) investigated the effect of Saharan dust transport over Mediterranean Europe during the last 10 years and this clearly needs to be better highlighted in our paper. This will be done. Some of these works are recent and the

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last ones have more or less been carried at the same time as ours, which makes an interesting point for comparison. It appears that our results show good agreement with these studies and this will be discussed in our paper.

However, first, the very major part of these studies have been conducted in Spanish rural and urban areas (mainly by the Institute of Earth Sciences, Barcelona), and no detailed data have been obtained and deeply analyzed in French Mediterranean areas. Only the paper by Querol (African dust contributions to mean ambient PM10 mass-levels across the Mediterranean Basin, 2009, Atmospheric Environment, accepted during the submission process of this paper!) proposes a comparison of dust impact on PM10 concentrations over several Mediterranean European areas, including French stations. From this point of view, our work thus proposes new data (from southern France) to complete the picture of dust impact in southern Europe countries and areas. In the corrected version of our paper, their comparison and differences with the data obtained in other Mediterranean areas will be emphasized.

Secondly, the scope of our paper is not properly the observation of elevated PM levels or the number of exceedances of EU limits for PM10, but it is more focused on the need (and the way) for a better forecast and public information on PM10 episodes, which has been less studied. Indeed, in spite of the good quality of atmospheric pollution forecasts in France, particulate pollution still remains a difficult issue for air quality agencies. By evaluating possible ways to enhance it, our work bring new elements to the dust and anthropogenic PM10 issue in southern Europe. In the conclusion of Astitha et al. (Air pollution modeling in the Mediterranean Region: Analysis and forecasting of episodes, 2008, Atmospheric research) it is stated: "The combined use of limited-area, meteorological models with chemical transport models can form systems that provide reliable predictions of atmospheric gas-phase pollutants. Nevertheless, there are remaining issues that require further investigation and refinement. The issues pertaining to adequacy in the emission inventories and land-use need to be better described and continuously updated. The meteorological fields together with turbulence in urban en-

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vironments must be improved to aid in better describing pollutant cycles. Long-range transport of atmospheric pollutants is also a key-factor in air quality degradation, which is equally as important as correctly implementing local emission sources." We totally agree with their conclusion and our work goes one step further, by proposing coupled CTMs simulations with dust-transport models and revision of emission inventories in order to predict moderate or even serious pollution episodes. The proposition of a way to improve aerosol modelling is consistent with Astitha et al. (2008) perspectives. Of course, we are currently working on all these papers to include them in the final version of our paper.

All other comments (technical, language, specific question on sentences) are also taken into account to improve by far our paper on ACPD. The final paper will be soon submitted including all corrections.

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