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Atmospheric Chemistry and Physics Discussions



# *Interactive comment on* "Simulation of the mineral dust content over Western Africa with the CHIMERE-DUST model from the event to the annual scale" *by* C. Schmechtig et al.

**X. Querol (Editor)**

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The paper entitled presents the implementation of the CHIMERE-DUST model for the simulation of mineral dust load and surface concentrations during 2006. The model outputs are compared with AOD and surface concentration measurements as obtained for different time scales (hourly, daily, etc). An evaluation study is presented here with the experimental databases.

The reviewers coincide in pointing that the presented results on model outputs have good agreement with the observations in specific cases, while the overall model performance is often non-satisfactory.

This is in my opinion the main question raised that was already commented you before accepting the paper for discussion.

Thus, when preparing the revised version, please consider this point and the need of a more close evaluation exercise using the US-EPA protocol for evaluation of modeling results commented by one of the reviewers. They will review again the revised version.

I am also attaching some comments from my side.

COMMENTS

1. Abstract. Line 10. The adjective 'fairly good' is not adequate for a scientific paper. You should also support the adjective with statements on 'for what purpose (climate, air quality,. . ..) the quality of the fitting of modeled and experimental data is good? Based on what tests you conclude it is good? Support with numbers the goodness of the agreement'.

2. Page 8038, line 28. There are by There is

3. Page 8042 Line 20. Do you mean South West, instead of South East?

4. Important: Page 8053. Apply the comment n.1 here: 'generally correctly reproduced' it is not enough scientifically sound for an ACP paper. Also for AOD 'consistent with measurements' has to be supported. You should also support the adjective with statements on 'for what purpose (climate, air quality,. . ..) the quality of the fitting of modeled and experimental data is good? Based on what tests you conclude it is good? Support with numbers the goodness of the agreement'. The one suggested by US EPA should be applied.

5. Important: Idem in Conclusions section 'considered as satisfying', 'reasonably well reproduced' for what and based on what? Support with available modeling test.

6. Figure 6 and related text shows different results from a number of satellite measurements, and the classical observations from Dubief in the 70s. Usually in winter,



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more southern source areas are active according influence of ITCZ position, whereas in summer, the central and northern parts of Sahara become more active. May you comment on it?

7. Also there is a problem of description in text, in summer you mention in text that SE zones are active. Do you mean SW by SE?

8. Important: Figure 12. The surface PM10 model results (in red dots, not in gray as stated in the caption, please correct it) give much lower results in Jan-April than the experimental data, also for Oct-Dec. This difference is yielding different seasonal patterns in the modeled and experimental PM10 data. You should comment on it, search on causes (lack of anthropogenic emission data???), including this discrepancies when you describe the agreement between experimental and modeling data. Note that for January modeling data would yield PM10 exposure levels of around 10 ug/m3, whereas the experimental data reach 100 ug/m3. This fitting is not appropriate for any air quality study.

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Interactive comment on Atmos. Chem. Phys. Discuss., 11, 8027, 2011.