

Interactive comment on “Aerosol sources in the western Mediterranean during summertime: A model-based approach” by Mounir Chrit et al.

Anonymous Referee #3

Received and published: 30 January 2018

This study presents the sensitivity of aerosols and their chemical composition over the Eastern Mediterranean as calculated by different model simulations performed in the framework of their ChArMEx experiment. The manuscript is very well organized and easy to follow, with a good level of English language. The manuscript is suitable for publication in ACP provided that the below minor comments are addressed in a revised version.

- Material and Methods
- 1) Is the WRF model configured with 1-way or 2-way nested?
 - 2) It would be good if more background is provided on how these different configurations for meteorology are designed.
 - 3) It is not clear from the text that both EMEP emissions and HTAP emissions are used

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in the simulations. Refer to Table 1.

- 4) Give more information on how the aerosols and organics are calculated in the model. Is it VBS that is used? Is the aerosol module operating on modal or sectional bins?
- 5) Make it clear that dust emissions are not calculated in the model but only provided from the boundaries. Also provide information on how the boundary conditions are calculated. It is only in the results section that MOZART model is mentioned.
- 6) Give more details on the SSE calculations. Is the surf zone included, how, or is only the open sea emissions calculated?
- 7) Table 1 and 2 should be explained in the text and provide the motivation and the reasons for these different scenarios more clearly.

Results

- 8) Why the time series analyses for 2012 shown in the appendix? This would also show the extend of the dust break contribution to the levels.
- 9) Explain Table 7 more clearly (in the caption maybe). What are the differences showing, period mean? What is the background of using normalized RMSE to show the sensitivity of the different inputs?
- 10) As Table 7 shows, majority of the sensitivity simulation target 2013. Therefore, please also show the composition of PM in 2013 too to assist the discussions.
- 11) Add that these are observed composition in Figure 3 caption.
- 12) What does the 0.04 ± 0.03 show in the Table 8?
- 13) Page 15, Line 2. Normalized RMSE varies between 44 to 267%, not 48?

Conclusions

What is the general conclusion of the study?

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