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Interactive comment on “Effects of mineral dust on global atmospheric nitrate concentrations” by V. A. Karydis et al.

Anonymous Referee #1

Received and published: 24 June 2015

General comments: The paper addresses relevant scientific questions within the scope of ACP. The authors do not clearly support to present novel concepts, ideas, tools, and data, but they analyze an interesting topic, i.e. the effect of desert dust on inorganics on the global scale, focusing on aerosol nitrate. The overall presentation is clear; some issues in the structure are pointed out. The last paragraph of the Introduction fails to support the motivation and goals pursued in the Results. Although results are sufficient to support the conclusions, more interpretations are needed for some findings. All of the above comments (and some more) are specifically described below and in the attached file.

Specific comments:

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Abstract: the abstract should be revised after all comments are taken into account, so that it serves as a concise and complete summary of the article. Indicative rewording is shown in the attached file.

Introduction: Each paragraph should have a clear and concise concept that serves to cover a specific aspect dealt in this work. Also, paragraphs should (in-)directly try revealing the new/original contribution of the current study. Apart from these general statements, specific comments are given in the attached file. Although a search in previous relevant studies was redone, I still find some missing (cf. attached file). After going through the whole text, I realized that the last introductory paragraph presented the work in a simplistic way. In other words, the study analyzes the physics and chemistry of dust on a global scale, but it is primarily presented as an improvement in modeling. I would suggest to rewrite this paragraph, so that it better supports the idea behind the paper, its motivation, goals and findings.

Sect. 2: comments are shown in the attached file.

Sect. 3: some kind of restructuring and elaboration is needed (cf. attached file).

Sect. 4 & 5: again, ideas for a different structure, as well some questions to be answered (cf. attached file).

Sect. 6: although interesting results are presented one-by-one, they are not summarized and some need further explanation (cf. attached file).

Sect. 7: comments for improvement are given in the attached file.

Minor comments in some tables and figures are given in the attached file.

The language is quite fluent and precise. Where appropriate, specific directions are given (cf. attached file).

Please also note the supplement to this comment:

<http://www.atmos-chem-phys-discuss.net/15/C3983/2015/acpd-15-C3983-2015->

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