

Interactive comment on “BEATBOX: Background Error Analysis Testbed with Box Models” by Christoph Knote et al.

Anonymous Referee #1

Received and published: 3 November 2017

Review

This paper describes the data assimilation tool BEATBOX. This open source tool should be very useful to the scientific community working with data assimilation in the area of atmospheric chemistry, both for research and teaching. The description of the tool is comprehensive and the examples illustrative. Thus, this paper will be of great interest to the scientific community.

The paper is suitable for publication once the authors address the comments below. They mainly concern providing further important details about OSSEs, and clarification of points made. The style of the language, including ensuring that the English is clear, is also a concern that needs addressing.

C1

P. 2

L. 21: Avoid subjective terms like "interesting".

L. 23: Do you mean Lorenz?

L. 28-29: Do you need "In fact"? Avoid needless words. Do this elsewhere in the paper, e.g., consider omitting the form "in order". Consider omitting "suspicious" in L. 19 of P. 17.

P. 3

L. 2: Indicate what you will do in each section of the paper.

L. 14: Perhaps comment that the space agencies, e.g., ESA, now support the use of OSSEs to inform on the performance of proposed missions. The authors could refer to the concept of scientific readiness level.

L. 22: Somewhere in this section, the authors should mention issues with OSSEs to take into account in their design: the cost; the "incest" or twin problem when the models producing the Nature Run and performing the assimilation experiments are the same; interpretation of results.

P.7

Eq. (3): I think a superscript "-1" is missing after the brackets.

P. 9

L. 26: I am not sure what you mean by clamping. Should it be "clumping"?

P. 10

L. 9: Do not anthropomorphize the data assimilation system. I suggest you use a word other than "tell". See also P. 15, L. 5; P. 17, L. 27. There are more instances.

P. 11

C2

L. 14: What transition?

P. 14

Fig. 5: I suggest that the caption includes the description of the line styles. Do this also for similar figures.

P. 15

L. 2: Which same experiments? Identify them here.

P. 17

L. 30-31: Rephrase and correct typos (this is an example of what to avoid). Check carefully the English language throughout the paper.

P. 20

L. 13: I suggest you replace “probably” with “likely”.

P. 24

L. 33: The Lahoz et al. reference is not in the main text. Please address.

Interactive comment on Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2017-188>, 2017.