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Geoscientific Model Development Discussions

Interactive comment on "Are contributions of emissions to ozone a matter of scale? – A study using MECO(n) (MESSy v2.50)" *by* Mariano Mertens et al.

Anonymous Referee #1

Received and published: 15 June 2019

This paper presents an analysis of simulations at various horizontal resolutions, with emissions at various resolutions, and different emissions inventories.

The research is technically sound, and the application of source tagging and attribution is well illustrated. However, the paper does not seem to have any new results. The models and tagging technique used have all been published previously. The majority of their conclusions confirm previous work. Their strongest conclusion seems to be that different emissions inventories making the largest difference in ozone simulations, which I think is well known, but they do not offer any assessment about which might be more accurate. If the authors feel they have more compelling results, then they should

make them much clearer.

It is not apparent why the authors thought GMD was the best journal for this work. It does not seem to have any new model development, or even quantitative evaluation of the model. The paper reads very much like a technical report for MESSy users. For example, it would help the general reader if 'ONEMIS' was defined and explained on p.5.

While I see no errors in this work, I feel significant revisions are required to make it suitable for publication. The paper should emphasize new results, not the confirmation of previous results. It would also be valuable to include comparisons to observations, and perhaps then conclusions can be drawn as to how fine does model horizontal resolution need to be to reproduce observations, and to reproduce accurately physical phenomena (e.g., vertical transport) that affect ozone distributions.

Technical corrections

p.4, l.17: 'to calculate' should be 'calculation of'

p.4, l.31 and elsewhere: 'lighting' should be 'lightning'

p.6, l.17: See -> Sea

p.14, l.27+: use "%" instead of "percentage points"; also 'respectively' is unnecessary.

p.15, l.1: 'effect' -> 'affect'

p.15, l.12: 'to quantify' -> 'for quantifying'

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