Atmos. Chem. Phys. Discuss.,
https://doi.org/10.5194/acp-2017-866-RC1, 2017

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Multi-year assimilation of IASI and MLS ozone retrievals : variability of tropospheric ozone over the tropics in response to ENSO" *by* Hélène Peiro et al.

Anonymous Referee #2

Received and published: 11 December 2017

Article acp-2017-866

General comments:

The paper is dedicated to the data assimilation of IASI that reproduces the variability of tropospheric ozone during 2008-2013, with validation by ozonesonde data in tropics. The manuscript is well written, with clearly presented analysis, and careful consideration of intercomparison between model outputs. I am reasonably positive about this paper. I do have some concerns, but I think they are totally addressable in discussions. The paper is interesting and should be published in ACP for further discussion.

Specific comments:

P7, l22. It is worth to mention that 4D-VAR assumes the model is perfect. Problems can be expected if model biases are large.

Do you expect that your results would significant change if the authors use other model besides MOCAHE? And why?

p8, l6. 'We specify the background error variances as a percentage of the modeled ozone profile equal to 15% in the troposphere and 5% in the stratosphere. ' How sensitive of your results to this setting? Since 4D-VAR might be sensitive to the initial condition. I think it would be important to address this issue.

p8, l21. Why second and third simulations don't require spin up?

P9, l10. Please specify which colocation method you apply here.

Please provide a consistent format in units, such as DU/ppbv, hpa/mb, in figures and text.

Technical corrections:

p2, l10. Missing comma

p4, l30. What's SOFRID stands for?

p7, l.21. 4D-Var (4-Dimensional-Variational): the long name should be appeared earlier in its first showing up.

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