

Interactive comment on “Ozone-sensitive channel selection over IASI full spectrum with correlated observation errors for NWP” by Olivier Coopmann et al.

Anonymous Referee #3

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General comments

This manuscript describes a study on selection of channels in the 10 micron ozone band, geared towards improving the representation of not only ozone, but also temperature and humidity in NWP analyses. As indicated by the references, there has been quite a lot of previous work on channel selection and it is not easy to show strong improvements relative to existing channel sets already in use. The authors have obviously taken care and paid attention to details in this study, but in general, I found the discussion of various different channel sets and subsets confusing. I was not able to follow the argument leading to the numbers presented in the abstract that described

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the magnitude of the improvements in temperature and humidity analyses.

I might suggest that the Introduction could be better formulated to provide a clear review of what other work is out there and what is important/significant about this work compared to previous studies. For example, the Ventress and Dudhia channel selection study is not mentioned until fairly deep in the paper, but it seems as though if this is an example of another study that utilized a non-diagonal observation error covariance, then it ought to be cited in the introductory material.

Would it be possible to include a table or tables to (1) review previous work on channel sets for ozone radiance assimilation and summarize the important advantages (or shortcomings) of how they were selected and (2) summarize the channel sets considered here and their performance/impact on the ozone/temperature/humidity analyses?

Minor comments/typos:

Page 2, line 14: Should be “principal components”

Page 5, line 24: Is PAN the appropriate abbreviation for Peroxyacetic Nitric Anhydride? My understanding would have been that PAN would usually refer to Peroxyacetyl Nitrate, which decomposes to form thermally stable Peroxyacetic acids (PAAs), which are then photolyzed. I am not a chemist, but it may be worth checking this one.

Page 9: “The ozone profiles from MOCAGE are realistic but do not represent reality.” This is an odd statement. The profiles may be closer to the truth than using a standard RTTOV profile, but that isn’t necessarily saying much. It would be better to just say that the ozone profiles from MOCAGE are, on average, biased (high) relative to reality.

Page 12, line 13: “positives correlation” should be “positive correlations”.

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