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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Validation of meteorological analyses and trajectories in the Antarctic lower stratosphere using Concordiasi superpressure balloon observations" *by* Lars Hoffmann et al.

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Dear authors and referees,

I would like to thank the referees for their thorough review and the authors for their clarifications. The fact that Concordiasi balloon data has been assimilated into the meteorological analyses cannot be ignored. However, in my opinion this does not justify a rejection. I am quite confident that the study can be brought into a publishable form with major revisions.

The authors presented already some ideas how they could improve their manuscript. Most important is that the fact that the Concordiasi balloon data is assimilated in the meteorological analyses is considered when performing the assessment and drawing conclusions. Nevertheless, the Concordiasi data are not the only data that is assimilated and one should not forget that meteorological analyses are based on model simulations. Thus, even with the Concordiasi data assimilated into the analyses the impact cannot be that severe that one cannot do a meaningful assessment of the performance of the meteorological data sets.

Contrary to the suggestion by the authors to remove the NCAR/NCEP I would suggest to keep this data set to have one "independent" data set in the comparison. To make the assessment then more concise the section could be split into two comparisons: one between NCEP and Concordiasi and another one comparing the Concordiasi data with ECMWF OP, ERA-Interim, MERRA and MERRA-2. A second option would be to just compare the meteorological analyses without comparing these to the Concordiasi balloon data. Further, I would appreciate if MERRA would not just be replaced with MERRA-2, but rather that both data sets would be used in the assessment. Another third option would be to include another independent data set into the comparison.

Another point that could be improved is the references to previous studies. There are a lot of studies comparing the performance of meteorological analyses by Gloria Manney and her colleagues (see list below). Additionally, I would suggest to change the term validation in evaluation or assessment throughout the manuscript.

Based on the suggestions for improvements given by the referees, by myself and by the authors themselves I would like to encourage the authors to conduct major revisions and resubmit their manuscript.

Best regards

Farahnaz Khosrawi

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