

Geosci. Model Dev. Discuss., referee comment RC2
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Comment on gmd-2020-315

Anonymous Referee #2

Referee comment on "Impact of Infrared Atmospheric Sounding Interferometer (IASI) thermal infrared measurements on global ozone reanalyses" by Emanuele Emili and Mohammad El Aabaribaoune, Geosci. Model Dev. Discuss.,
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Summary

The paper titled 'Impact of IASI thermal infrared measurements on global ozone reanalyses' by Emili and Aabaribaoune aims to answer the question: what benefit does using the IASI-r O3 reanalysis have over using the IASI-a O3 reanalysis and how well does it reproduce measurements compared against alternative approaches?

I recommend publication once the following minor revisions have been addressed.

General Comments

A well planned methodology, clear results and valuable discussion make for a high quality paper that is suitable for GMD.

Specific Comments

page 2 lines 15-20: the uninterrupted nature of IASI measurements versus the interrupted nature of TES measurements is a key motivation for the paper. However because the reader is not told what measurements Inness et al. (2019) use, this motivation is not so clear.

page 6 line 18: it would be beneficial to quantify 'very small', even just a headline number to give the reader a feel for the significance of changing from 4D- to 3D-Var

page 6 line 19: as pointed out by the authors the radiative transfer model changes between IASI-a and IASI-r, but there is no comment on the effect this has on resulting O3 fields. The reader would appreciate the distinction between the effect of changing IASI product level and the effect of changing radiative transfer model.

page 7 line 3: could the reason for using a dynamical filter to reject pixels that differ from the model by more than 12 % be given?

Technical Comments

page 2 line 7: should assess be assessing?

page 2 line 16: I don't understand what Huijnen et al. (2020) compared - was it comparing Inness et al. (2019) against Miyazaki et al. (2015)? Please make clearer what is being compared here.

page 2 line 17: does 'similar accuracies' mean the accuracy when compared against radio-soundings as a reference? If so, please make clearer what the meaning of accuracy is in this section.

page 4 line 5: change 'took part to' to 'took part in'

page 4 line 10: change 'for the 2010' to 'for 2010'

page 4 line 27: 'heritage' makes IASI-a sound like an old legacy method, perhaps 'product' would be more suitable

page 4 line 29: change 'In the recent years' to 'In recent years'

page 5 line 23: I cannot see a definition of the OMI-MLS acronym, nor the separate definitions of OMI and MLS

page 7 line 12: change the second 'ii' to 'iii'

page 8 line 26: change 'This type of statistics are' to 'This type of statistic is'

page 10 line 17: is the intention here to reference the empirical bias correction of both Emili et al. (2014) and Peiro et al. (2018)? If so, please replace the semicolon with 'and'

Figure 4: please make legend labels consistent in spelling with caption and main text