

Interactive comment on “Intercomparison of polar ozone profiles by IASI/MetOp sounder with 2010 Concordiasi ozonesonde observations” by J. Gazeaux et al.

Anonymous Referee #1

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Overall an interesting and relevant paper. The data are well presented, the measuring and analysis methods seems to me sound, proper figures are used. The text needs some editing and improvements (I already made some suggestions for some parts of the manuscript) since the English is not always of good quality. This manuscript suffers a bit from the little effort undertaken by the authors to discuss the effect of varying collocation criteria for satellite-sonde match on the validation results and interpretation. I also would like that the authors elaborated more on the data retrieval and on how they handle the little thermal contrast between surface and atmosphere inevitable affecting the measured radiance and the accuracy of the ozone retrieval. Or stated

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otherwise, how are the authors dealing with the reduced sensitivity of the retrieval at high latitudes? That should be the message of this paper since it is dealing with ozone retrievals over the Antarctic using thermal emission observations.

P7924L3: use “vertical sensitivity” instead of “height sensitivity”;

P7924L4: omit “the” before ozone; Also in other parts of the manuscript the word “the” is redundant and hampers readability of the text.

P7924L7-8: The sentence “This campaign was . . . ” needs to be rewritten (splitting in two parts?);

P7924L11: replace “altitude” by “vertical”;

P7924L12: suggest to replace “differ” by “varying” or similar word;

P7924L15: should be “considered vertical range”;

P7924L20-21: should be “This study allows a better characterization of IASI retrieved ozone over the polar region during ozone depletion/recovery processes. ”

P7924L23: should be “Surveying ozone distribution over . . . is an important task in order to quantify/ for quantifying ozone depletion . . . ”;

P7925L2: include “,” after decades;

P7925L4: “Spring” should be “spring” and a referenced should be added;

P7925L6: should be “United States” without “the”;

P7925L9: aimed to or aimed at?

P7925L11-15: rephrase sentence; I prefer low thermal contrast rather than low temperatures . . .

P7925L23: should be “Ozone is one . . . and IS the focus of this paper”;

P7925L24: remove “the” before ozone products;

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P7925L26: should be "... both for accuracy as well as for characterizing the profile data";

P7925L28: Insert blank space after campaign. Change to "This paper is organized ..."; Section should be fully written (see also next page) and without a capital letter. etc

Section 2.1. IS the optimal estimation approach of FORLI similar to for instance the TES retrieval methodology? (Rodgers ...);

Section 2.2. Split sentence in two parts, remove commas;

P7927L20: should be "... the readers are referred to ...";

P7927L28: should be "... IASI profiles which are at the smallest distance of the balloon ...";

P7928L14: "reducing the risk of a poor comparison": Do the authors not mean "reducing the risk of a poor sampling"?

P7928L15-16: "The fact that McMurdo is inside the vortex guarantees stability to ozone profiles and makes the comparisons more useful"; Should it not be "The fact that the balloon launches at McMurdo all occur inside the vortex guarantees stability to ozone profiles and makes the comparisons more useful"?

P7928L20: It should be "one cannot directly compare";

Equation 1: I am not in favor of the annotation of the terms in the equation. It is much more convenient for the reader if "low" and "high" are substituted with "IASI" and "sonde";

Equation 3: is there any evidence that the data are Normally distributed? Did the authors check that? Why not using a Student t distribution? I am not sure that 1.96 is the appropriate choice;

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P7930L5: remove "that have been carried out";

P7930L11: "own" should not be used. Rephrase...

P7930L15: superscripts needed for 2nd and 3rd;

P7930L27: should be "equals"; remove "to"; How can you explain that the confidence interval is vertically nearly constant?

All over the manuscript: I prefer to directly add

P7931L17: Define, quantify what you mean with a large gradient;

P7931L18-23: this is not a proper sentence; Rephrase and split. Three times the word "observe" is too much. Moreover, it is hard to understand;

P7932L23-25: How can you draw this conclusion from figure 5? Can the author clarify that?;

P7932L7: add "TES" after Trop. Emiss. Spectrom.

P7932L15: I prefer to use months instead of season names (spring: NH MAM, SH SON);

P7933L1-4: Rephrase. What the authors mean is that the IASI overestimation occurs independent from the ozone depletion process?

Fig. 1.: Should be "The black box indicates the longitude/latitude span in which ...";

Fig. 4.: Should be "retrieved"; Should be "missing values"; these values are given in grey?

Fig. 5.: Enlarge figure. Now hard to read. "Collocation criteria ARE given ...";

Fig. 6.: Clearly different vertical structures occur before and after 19 Sep. Can the authors comment on that?