Atmos. Chem. Phys. Discuss., 11, C15243–C15245, 2012
www.atmos-chem-phys-discuss.net/11/C15243/2012/

Atmospheric Chemistry and Physics Discussions

Interactive comment on "Analysis of IASI tropospheric O_3 data over Arctic during POLARCAT campaigns in 2008" *by* M. Pommier et al.

Anonymous Referee #2

Received and published: 10 February 2012

The paper by Pommier et al. builds on previous validation work of IASI O3 products with particular reference to the POLARCAT activities during 2008 as part of the International Polar Year. Comparisons with lidar are also shown. Retrieval of gas concentration information over cold surfaces is a particular challenge for nadir-viewing instruments such as IASI and these results give an insight into the quality of tropospheric O3 data in the Arctic. It is suitable for publication after some corrections are made. In many parts of the article, the English writing is not very clear. I make observations for the major corrections, but would urge the paper to be corrected for these technical writing errors by a native English speaker.

General comments

- the authors produce an ACE-FTS climatology using all data between 2004 and 2009. Is cloud-clearing or cloud filtering applied to the ACE data? If no cloud-filtering applied, this will lead to a bias in the ACE-FTS data, and hence your climatology, affecting your comparisons. Is this accounted for in the sensitivity tests on p 33140, l2-5?

- As the tropopause levels only vary by 0.3 km between land and ocean, why does this cause the FORLI retrieval scheme to have "slightly more difficulties in the UTLS over land" (section 5.2)? Is this not a surface/topography effect or another inhomogeneity within the IASI scene?

Specific comments

Title - The title should read "over the Arctic" rather than "over Arctic". There are several instances throughout the text, and other section titles, lacking the word "the" before "Arctic" which should be corrected.

P33129, l6 – unnecessary to define IPY as not used again in the abstract.

P33129, l12 – information content and degrees of freedom for signal (DOFS) are different quantities as defined in Rodgers (2000). Extended use is made of DOFS in the analysis, not information content which is a measure of entropy. Please correct.

P33134, l10, please insert "of" between "differences" and "less"

P33134, l19-26. Why were these specific criteria chosen? Are they related to the IASI noise (which isn't mentioned) or simply the spectral fit? Also, why was a solar zenith angle of 83o chosen as the threshold for daytime data? Is there a reason the 84o causes data issues? Or is it to allow for an error in determination of SZA?

P33135, l8, the authors should reference Clerbaux et al. 2009 which discusses the challenges of retrieval over cold surfaces with low thermal contrast.

P33136, l8, please remove the name "Adam" from the reference

P33140, l1, please replace than by that

P33140, l15, please add “s” to RD

P33143, l19, please insert the word “to” between “according” and “surface”

P33145, l16, please insert “the” between “by” and “IASI”

P33147, l19, please remove “as well” as it does not fit into the sentence

Figure 3. It would be useful if the Altitude range on the y-axis were extended as the 37-40 km averaging kernels are plotted but the y-axis only extends to 34 km.

Figure 6-10: it is a little difficult to read the text on the plots due to small font, please rectify.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 33127, 2011.