

Interactive comment on “A-train CALIOP and MLS observations of early winter antarctic polar stratospheric clouds and nitric acid in 2008” by A. Lambert et al.

Anonymous Referee #2

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This study primarily combines CALIOP and MLS observations to examine PSC formation and the resultant denitrification in the Antarctic and clearly demonstrates the power of combining observations from multiple instruments to gain a better quantitative understanding of the processes examined. This work is extremely thorough and the analysis which also includes examination of data from other satellite instruments and the use of a range of models is exceptional. The introductory sections (Section 1 and 2) also clearly demonstrate the expertise and understanding of the authors and more than provided the relevant background for the reader. I also found Section 4.5 particularly valuable and it would be well worth a paper in its own right in my opinion. The authors should be proud of the work that they have completed. The very com-

C13923

plete and high quality of the analysis performed in this work means it is clearly worthy of publication. I have indicated a very small number of suggestions for improvement considering the length of the paper below.

Suggestions/Questions

Organisation: The work in Section 3 and 4 is very detailed and some areas would be improved by adding some extra explanation and/or providing summaries of the main points at the end of certain sections. For example, Section 4.4 and 4.5 are both quite long and summarising the main findings as bullet points at the end of these sections would probably help the reader as the text is very dense and the length of the work means important points can be easily missed.

Page 29298 Line 5: Is this under an assumption of Rayleigh scatter?

Page 29298 Line 20: Are these equations really necessary – they seem obvious.

Page 29304 Sentence starting on Line 1: Do you mean you simulated with two aspect ratios or in a range between the two limits? Some extra explanation of this point would be useful.

Page 29310: I think the TTE idea and correspondence between high TTE areas and denitrification is excellent – perhaps this deserves extra emphasis in the Conclusion section.

Page 29317 Line 4: I may have missed something earlier. But, can you clarify where the renitrification occurs exactly along the track and why it is renitrification rather than an area which has never been denitrified.

Page 29319 Sentence starting on Line 18: Given the mean background wind field wouldn't it be surprising if the trajectories didn't pass over the peninsula? Therefore can you prove this point in another way?

Figure 7 and 14: Can you add scales to (h) so that you remove (g) and (i) in these

C13924

figures?

Figure 16: Either the caption or panel(c) needs improvement as I can't understand the colorlabel.

Typographical suggestions

Page 29291 Sentence starting on Line 23: This sentence is slightly confusing please clarify.

Page 29295 Line 21: Remove (hectopsacal) this is not necessary.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 29283, 2011.

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