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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Ozone monitoring with the GOMOS-ENVISAT experiment version 5" *by* P. Keckhut et al.

Anonymous Referee #1

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1 Summary

Keckhut et al. present an important and interesting analysis of an obviously major error source for ozone profiles from the GOMOS instrument onboard ENVISAT. As GOMOS ages, dark count levels from the aging CCDs have increased substantially. The limited resolution of the temperature measuremement required for dark count estimation, in combination with artificial clipping of negative values in the algorithm, have resulted in more and more frequent appearance of unrealistically low ozone profiles in recent years. The authors very plausibly demonstrate the underlying problems. They also show that an improved processing can very likely correct the problem. Unfortunately data from the most recent years (2007 to 2010) are not shown, although they should

have the largest effects.

Clearly this is a very important paper on the data quality of an important instrument for monitoring of the stratosphere. There are a few things in the paper that should be improved or corrected.

2 Major comments

- The use of English throughout the paper is often quite poor. I think the paper would benefit greatly, if a native English-speaker would go over and correct the English.
- I find it very disappointing to see only data up to mid-2006 in a paper appearing in mid-2010. GOMOS data are available from ESA a few days after the measurement. The Swiss GROMOS data are available from NDACC until mid 2009. The authors are closely affiliated with the ozone measurements at OHP. They should have easy access to current data from OHP. In my opinion, the authors need to include all these data in their plots 5 and 6, and in their analysis. Figure 6 would benefit the most, because in the current plot with data only up to mid-2006, I see very little clear evidence for lower values from GOMOS. Without clear evidence from OHP, how can we exclude a drift in the Swiss GROMOS data?

3 Minor comments

Page 14714, line 6: What about the years 2007, 2008, 2009, 2010?

Page 14714, line 7: Give magnitude for the bias. What about profiles with only a small bias, say 10%? How can you be sure such profiles are not present as well?

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Page 14714, line 11: Please specify filtering criteria explicitly, so people know what to do.

Page 14717, line 14: Give references.

Page 14717, line 20: Can't understand that. Replace "to provide an adequate confidence of 800 km and 20 h" with "is obtained for a matching radius of 800 km and 20 h"?

Page 14719, lines 0 to 7: It is not clear to me what is going on: Does the current GOMOS analysis not account for dark charge? Or does it already use the dark sky area? If so, is the problem in the extrapolation of dark sky area counts via (changing) temperature to each actual occultation? Or in the extrapolation of other dark counts via temperature to each occultation? Please clarify.

Page 14720, lines 0 to 2: Ok, some profiles show a very large bias and are clearly unrealistic. They probably have large errors in the estimated dark counts. But what about small errors in the dark counts, that bias profiles by just a few percent? How can these be excluded? Do they occur? How accurate is the new V7.0ab processing? These things should be investigated. Or at least mentioned, and investigated in the future.

Page 14720, line 4: "ozone variability can be monitored too much" One example for bad English. I don't understand what is meant here.

Page 14720, lines 18 to 20: see comment for Page 14720, lines 0 to 2

Page 14721, line 25: Contradiction to line 25 of previous page.

Page 14722, line 2: typo ")"

Page 14723, lines 20 to 24: I can't see that in this Figure. Show more data up to 2010! Show longer term means? Show distributions? Also this description is too short (compared to the long introduction).

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Interactive Comment