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## ***Interactive comment on “Technical Note: a combined SBUV and SAGE zonal-mean ozone data set” by C. A. McLinden et al.***

### **Anonymous Referee #2**

Received and published: 8 July 2009

Review of "Technical Note: a combined SBUV and SAGE zonal-mean ozone data set" by C.A. McLinden, S. Tegtmeier, and V. Fioletov

### GENERAL COMMENTS

This paper presents a vertically resolved global ozone database derived from SBUV(/2) measurements corrected for inter-instrument biases using the SAGE I and SAGE II data sets. This is a good piece of research and the results will be of interest, and use, to a wide range of the ACP readership. The corrections required are mostly minor.

### SPECIFIC COMMENTS

Abstract: I think that the most important piece of information missing from your abstract is that this is a vertically resolved database. Sure, many of your readers will know that

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SAGE and SBUV are vertically resolved, but for those that don't this is a vital piece of information. I think that the abstract should also include one sentence that describes why you did what you did. What was the motivation for this research?

Page 12386, line 15: I definitely wouldn't call this the "post-Montreal Protocol era". The Montreal Protocol remains very much in force and in fact may be even more necessary now than it ever has been. If the protocol were to be abolished tomorrow, I am quite sure that rampant use and emissions of CFCs would follow.

Page 12386, line 22: Well this is a bit of a value judgment and may be overstating the case. Perhaps replace 'is a daunting challenge' with 'is challenging'.

Page 12387, line 2: The reader gets to this point in the paper and still hasn't been told that it is a vertically resolved database that is going to be presented. You need to make it clear up front that your database, and some of the others that you cite, are vertically resolved.

Figure 1: I think that this figure would be much clearer if you just made it as a filled contour plot and not as a coloured line plot.

I think that the Introduction needs to say a little more about exactly why vertically resolved ozone databases are required. You should explain a little more how this database that you have constructed might be used.

Page 12388, line 21: I couldn't find Table 2 anywhere in the manuscript.

Page 12389, line 5: I think that you mean 1981 and not 2001.

Page 12389, line 8: I think you need to say more what this "high-tangent altitude reference" is or provide a citation where the reader can go for more information.

Page 12389, line 19: Noting of course that the native vertical resolution of the SAGE retrieval is nowhere near as good as 0.5 km.

Page 12390, lines 11 to 14: This sentence doesn't make sense to me. What were the

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differences in layer 7?

Page 12390, line 18: Why is it unlikely that this completely eliminates this source of bias? If the bias only happens when the beta angle drops below 60 degrees and if you exclude all data when the Beta angle drops below 60 degrees, surely that should completely eliminate that source of bias?

Page 12390, line 26: You need to expand the SZA acronym, or, if you only use this once, it would aid the readability of the paper by just writing solar zenith angle.

Page 12391, line 15: Just to confirm: was this SR/SS bias correction applied to both the SAGE I and SAGE II data or just to the SAGE II data? Ah, OK I see now on page 12392 that it was applied only to the SAGE II data.

I really like this SAGE SR/SS bias correction.

Page 12394, line 7: I don't know what you mean by "is found" in the sentence "A three-month running mean of this correction is found". Where did you find it?

Page 12395, lines 1 to 3: This sentence doesn't make sense to me. First, what does the "(?)" denote? Secondly, why should an interruption in the SAGE II data record in 2000 introduce a gap in the SAGE-corrected SBUV data? In that case there should be a gap between 1981 and 1984?

Page 12395, line 20: You should say here why you had to use QBO basis functions at two different levels in the atmosphere.

Page 12395, line 22: Only an annual harmonic term? No semi-annual or 4 month terms? It seems that that's unlikely to capture the strong seasonality in the EESC and QBO fit coefficients, especially for EESC at high latitudes - we know that the response of ozone to EESC doesn't just vary sinusoidally through the year. In that regard, it would be instructive to see your Figure 11 but evaluated in March and October, and how well that compares to other studies.

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Figure 11: The label at the top of panel a is confusing. I think this should be changed to "SAGE-corrected SBUV".

In Figure 11 why do you only show results between 60N and 60S when from Figure 9 it is clear that you have data well poleward of those latitudes?

Page 12396, line 2: I don't think it would excessively lengthen your paper by replacing NH with Northern Hemisphere and it would certainly improve the readability of the manuscript.

### GRAMMAR AND TYPOGRAPHICAL ERRORS

There were way too many typographical errors in the manuscript. It really became distracting after a while. Here are some (but not all) of the corrections required:

Page 12386, line 16: Replace 'visa-versa' with 'vice-versa'.

Page 12387, line 22: Replace 'data has been' with 'data have been'.

Page 12388, line 13: Replace 'Ozone data is' with 'Ozone data are'. The word 'data' is plural. Its singular form is 'datum'. Please go through the whole manuscript and make the appropriate corrections.

Page 12388, line 15: Replace 'and increase' with 'and increases'.

Page 12390, line 22: Replace 'the lifetime of odd-oxygen (O+O3) lifetime' with 'the odd-oxygen (O+O3) lifetime'.

Page 12389, line 22: Replace 'Validations studies' with 'Validation studies'.

Page 12390, line 8: Replace 'is employed' with 'are employed'.

Page 12393, line 3: Replace 'Each SBUV layers' with 'Each SBUV layer'.

Page 12393, line 11: Replace 'fraction overlap' with 'fractional overlap'.

Page 12394, line 29: Replace 'were deviations' with 'where deviations'.

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Page 12395, line 3: Replace 'tro panels' with 'two panels'.

Page 12395, line 12: Replace 'were fit with' with 'were fitted with'.

Page 12396, line 12: Replace 'be also' with 'also be'.

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Interactive comment on Atmos. Chem. Phys. Discuss., 9, 12385, 2009.

ACPD

9, C2573–C2577, 2009

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