

Interactive comment on “Ozone sonde cell current measurements and implications for observations of near-zero ozone concentrations in the tropical upper troposphere” by H. Vömel and K. Diaz

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Specific Comments:

Page 3155, line 10 - The sentence needs restructuring. The ECC may have an accuracy of 5%, but I doubt the same is true of the tropical atmosphere.

We modified the text to point out the reduced uncertainty in the tropical troposphere.

Page 3156, line 5 - the authors may wish to introduce the terms 'cathode and anode' following two half cells, rather than mentioning these later in C1396

the paper. line 8 - Can we ever be sure that the solutions don't mix? I recommend using 'impede' rather than preventing mixing... line 16 - Define 'the external circuit'? line 23 - Rather than 'air temperature entering the cell' I believe the authors mean T in [K] is the 'temperature of the air entering the cell', Page 3157, line 18 - The work of Torres (Torres, A. L., 1981: ECC ozonesonde performance at high altitudes: Pump efficiency. NASA Tech. Memo. TM 93290, 10 pages) might be mentioned since is a highly recognized work describing a method to obtain the pump correction. line 29 - A different recommendation? The meaning of this is not clear.

We edited the text according to the recommendations.

Page 3159, line 1 - I can not relate to 'synthetic' air. I suggest 'compressed laboratory grade air with moisture removed. Furthermore, Page 3160 uses the term 'compressed purified air',

We edited the text according to the recommendations.

Page 3160, line 5 - Sentence beginning with Figure 2, could be made clear, the sentence is difficult to follow. line 25 - I may have missed the definitions, but what does t , t_0 , I_0 , and I_0' mean?

We edited the text. For simplicity we removed the term t_0 , since measurements have been referenced to $t_0=0$. I_0 , and I_0' are the cell current contributions from the two different reactions at $t=0$. This has been explained in the text.

Page 3161, line 19 - ... at defined ozone concentrations. I take this to mean, ... after ECC exposure to defined ozone concentrations.

Correct.

Page 3162, line 1 - Should ... 'at higher ozone concentrations'... be changed to ... 'after exposure to higher ozone concentrations' ...

This part of the sentence was confusing and superfluous. We removed it.

Page 3162, line 5 - Figure 3 is not labeled a nor b, but caption of Figure 3 reads, Top: and Bottom:

Fixed

Page 3163, line 20 - The function appears quite acceptable. The authors need to include the number of runs made to determine α and β . According to Figure 4, it does not appear to be too many.

We have included a statement on the number of runs and number of levels in the description of figure 4.

Page 3165, line 18 - Would it be clearer if 'exceeded' was replaced with 'was larger than' in the text?

Corrected.

Page 3167, line 22 - 'monotonously' means dull or tedious. Would 'monotonically' be a better word to use?

Thank you for the correction. We can certainly say that ozone is never dull.

Page 3169, line 10 - 'maybe' should be 'may be'.

C1398

Corrected

Figure 2 - The square symbols at top of figure and their relationship to the buffers need to be explained, and also in the text.

Done

Figure 3. - It would be interesting to look at decreasing values of ozone. Is the same relationship between the ECC and TEI found?

Figure 3 actually shows two decreasing step changes and three increasing step changes. We varied the sequence of ozone levels throughout the runs to cover both directions. Towards the end of each plateau the direction from which this plateau was reached was no longer relevant.

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C1399