

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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General Comment: This paper expresses concern about the ECC background current measurement validity. Rightly so, since it is a serious source of measurement error, not only in the tropical upper troposphere but directly off the surface where ozone is relatively low. Although the authors concentrate their report on measurements in the tropical upper troposphere and ozone hole, the issue of background validity applies almost everywhere. The authors mention large background currents, and these do occur, however, at Wallops Island background currents less than $0.05 \mu\text{A}$ are the norm,

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and mostly are less than $0.02 \mu\text{A}$. Perhaps, the difference experienced at Wallops may be a result of different techniques. The authors have, undoubtedly, highlighted a source of error that the community should note and apply.

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.

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 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.

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',

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, t₀, I₀, and I'₀ mean?

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

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

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exposure to higher ozone concentrations' ...

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

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.

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

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

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

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

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

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