

Interactive comment on “A network of autonomous surface ozone monitors in Antarctica: technical description and first results” by S. J.-B. Bauguitte et al.

Anonymous Referee #1

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review of amt-2010-177

Title: A network of autonomous surface ozone monitors in Antarctica: Technical description and first results

Authors: S. J.-B. Bauguitte et al.

The submitted manuscript presents the off-grid operation of a set of 10 fully autonomous ozone monitors in Antarctica. The instruments were operated for about one year to learn more about the ozone distribution in Antarctica and to specifically study particular processes such as the ozone depletion events. The paper is well written,
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clearly structured and comprehensively describes the commercially available components, the applied modifications, the custom-made software, the performed tests prior to the installation, as well as gives an overview of the overall performance in the field and the data processing and presents some first results.

The paper is certainly within the scope of ‘Atmospheric Measurement Techniques’ and is of sufficient originality to merit publication in this journal. However, it needs some minor revisions before publication (see comments below).

Specific comments:

Abstract: page 5796, lines 2-4: the first sentence is a bit misleading. No new ozone analyzers were developed. Commercially available monitors were customised, a power generation system was set up, and a smart instrument control software and data logging was developed. Please clarify.

Page 5798: ‘... British Antarctic Survey ...’. Add acronym.

Page 5799, line 23: ‘... as cheap as possible ...’. Costs shouldn’t be the determining factor. ‘Cheap’ gives to my mind a kind of negative notion. I would rather choose ‘inexpensive’ but I am not sure if that really makes it sound better.

Page 5800, lines 12-22: Where and how have these tests (and others, e.g. mentioned on page 5809, line 10) down to -40C been performed?

Page 5800, line 27: accuracy and precision are given for which aggregates? Single readings? 10min averages?

Page 5801, line 19: ‘... a 6W heater was used to prevent ... freezing ...’. Has the heater also been controlled by the logging and control software? How was the heater turned on and off?

Page 5802, lines 1-8: what is the minimum wind speed requirement for wind power generation?

Page 5802, line 25: 'BAS'. Acronym isn't explained so far.

Page 5803, line 14-15: Have the GPSs also been supplied by the battery boxes? Did they ever run out of power?

Page 5805, lines 5-7: Validation of calibration: what does that mean? Did all ten instruments run side-by-side along with the TEi49C at Halley during a couple of days? Would be interesting to see how this intercomparison looked like (or was it maybe done at BAS before). Such a test could prove that all instruments performed equally well and that the differences observed later were really caused by different atmospheric concentrations.

Page 5805, lines 8-12: this was done in the UK? 'TEi49C' in line 8 has to be read 'TEi49PS'.

Page 5805, lines 18-22: '... a visual inspection of the inlet tubing ...' How did the tubings look like? How was this considered for the data processing? 'Dirty' tubing could rather cause O₃ losses in the inlet system. Was this somehow tested after dismantling?

Page 5807, line 1: '... making a measurement every 60s ...' This is a contradiction to page 5801, line 2-3, where the author states that O₃ mixing ratios were logged as 1min averages of 10s measurements.

Page 5807: the first 2min of data had to be rejected due to the temperature drop during the checks. How did it look like in winter when the lamp was off for nearly 3 days and only on for 2h? Please clarify. Same for the remaining summer months (2h measurements after a 4h break). At least refer to following paragraphs.

Page 5814: The authors should also provide an outlook. Are the ODEs seen at all sites? Are there any other interesting features that will be looked at in more detail in the future? What will be done with the processed data? Any other publication in preparation? Will the instruments be employed again? Are the suggested improve-

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ments (thermal insulation, stronger power generation, other CPU) planned to be implemented?

Table 1: add installation and dismantling date for each instrument? So far the information is pretty vague (page 5799: ... deployed during December and January 2008 and operated until approx. January 2009 ...).

Figures 3-7: which time resolution is shown here?

Figures 9 and 10: is it possible to highlight the data shown in the right panel in the left panel? Do you show 1min averages?

Fig. 11: why do you see two clusters for site F and J (and not for site G)?

Figure, general comment: the font sizes of the axes and the labels of some figures might be too small (e.g. Fig. 12), especially when assuming that the figures will finally appear in a size to fit onto one column width (e.g. Figs. 3, 4, 6, and 8).

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