

Atmos. Meas. Tech. Discuss., 4, C2301–C2303, 2011

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AMTD

4, C2301–C2303, 2011

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Comment

Interactive comment on “The dynamic chamber method: trace gas exchange fluxes (NO, NO₂, O₃) between plants and the atmosphere in the laboratory and in the field” by C. Breuninger et al.

C. Ammann (Editor)

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I agree with the generally positive reviews of the referees concerning the scientific content and relevance of the present manuscript.

In addition to the comments given by the three referees I see the need to address the following points:

p5190ff.: In Eqs. (4.x) and following, overbars (average values) for some quantities in the chemistry terms are introduced. This is done without sufficient explanation. It remains questionable whether e.g. the use of averaged O₃ and NO concentrations for

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the regression analysis of NO₂ (Eq. 4.1 ff.) does not lead to systematic errors. This procedure assumes that - while NO₂ ambient concentrations vary over a large range - the concentrations of NO and O₃ either remain nearly constant or vary uncorrelated to NO₂. However, in field conditions it is often observed that the concentration time series (diurnal or synoptic cycles) of NO, NO₂, and O₃ are strongly correlated (or anticorrelated) to each other. Therefore the authors should consider and discuss this issue thoroughly.

p5221,line 1-2 (and Figs.13b,14b): It is not clear to the reader, how the regression lines of F_{ex} vs. m_s in Figs. 13b and 14b have been calculated. The text refers to Eq. (5.1) while the figure captions refer to Eq. (8.1.1). Both of these equations contain the parameters b_1 and n_1 that are defined as linear regression parameters for m_s vs. m_a , which is a bit confusing.

p5221,line 17-21: This information about the experiments should be given earlier, either in the method or in the results section.

p5221,line 5222: How should the photosynthesis and transpiration rates of "enclosed and comparable non-enclosed parts of the plant" be checked?

p5225,line 4: The numbers seem to be not consistent. Shouldn't it read here "3.3 nmol/m³ (0.075 ppb)"?

p.5268, Fig.10: The black solid line in this figure is misleading. It starts to rise before time = 0 (start of He addition) and it also shows a wrong shape around t=0. The rising curve should rather show an exponential approaching to the higher Helium level.

LANGUAGE CORRECTIONS

p5216,line 25: replace "controlled" by "checked" or "quantified"

p5217,line 4: change to "...have been determined..."

p5226,line 25: I assume that "from each other" should be replaced here by "from zero".

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p5227,line 20: The use of the word "Furthermore" gives a misleading impression here. Not measuring all components of the triad was probably in direct connection to the use of zero/filtered air. I thus recommend to replace "Furthermore" by "This was related to the fact that ...".

p5227,line 14: The term "not true" should not be used here, because the true value is not known! I recommend to modify the sentence to "...will be overestimated (see below) while they erroneously appear to be (highly) significant."

p5234,line 14: Is the meaning here "more than 0.1 ppb"?

Interactive comment on Atmos. Meas. Tech. Discuss., 4, 5183, 2011.

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