Interactive comment on “The dynamic chamber method: trace gas exchange fluxes (NO, NO$_2$, O$_3$) between plants and the atmosphere in the laboratory and in the field” by C. Breuninger et al.

C. Ammann (Editor)

christof.ammann@art.admin.ch

Received and published: 6 December 2011

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
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 ant.correlated) 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".
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"?