

## ***Interactive comment on “Field investigations of nitrogen dioxide (NO<sub>2</sub>) exchange between plants and the atmosphere” by C. Breuninger et al.***

**Anonymous Referee #2**

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### **1 General comments**

The paper presents results of NO<sub>2</sub> exchange measurements between the atmosphere and branches of spruce made by dynamic chambers over a period of 1.5 months. The main results are rather low deposition velocities and compensation point concentrations that are not different from zero.

The applied methodology is very good and well documented. One main point of the paper is that the method for analyzing NO<sub>2</sub> is precise in the terms of the applied photolytic converter, which has negligible interference from other nitrogen compounds.

The authors discuss their results in relation to previously published results and con-

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clude that their deposition velocities are lower than those of many other studies and that they do not find a compensation point as claimed in some other papers. This is an important statement, but it is quite difficult to judge the possible error of previous studies, because it is not known how important interferences from other nitrogen compounds could have been. The present paper could be improved by giving information of the magnitude of the possible errors due to conversion of other nitrogen compounds by the analyzer, due to chemical reactions in the chamber, and due to chamber wall effects.

In general, I find that the paper is well written and structured, however, I suggest that the authors are more stringent in what material goes into “Materials and Methods” and “Results” and what goes into “Discussion”. E.g. the discussion of the advantages of photolytic converters (p.18169, l.23 to p.18170, l.1) should be moved.

### **2 Specific comments**

p.18164, l.17: “unequal **to** zero”

p.18164, l.21: more specific than what?

p.18166, l.24-27: I do not get the point here: Why is this an argument for the lack of a compensation point?

p.18168, l.10: With respect to what was the scanner calibrated and how?

p.18174, l.8: How large was the total set of observations? And how many flux values were disregarded due to this criterion?

p. 18170, l.4: Does the (low) conversion efficiency affect the accuracy and precision of the measurements?

p.18175, l.11: “enclosure”

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p.18178, l.24: I suppose it should be: “**atmospheric** NO<sub>2</sub> concentrations”

p.18181, l.3-5: I do not understand this sentence; should it rather be “**results in 11-37% lower deposition velocities**”?

p. 18183, l.4: It would be useful to include the size of the corrections (eq. 1) in this study to make the reader reflect on the possible size of the error.

p.18184, l.20: Rather than using the term “unlikely”, I prefer to say that the values were not “**significantly different from zero**”. Actually this does not necessarily mean that there is no compensation point, just that the current precision of measurements are not able to detect it. The rephrasing should also be done elsewhere in the manuscript e.g. p. 18177, l.14.

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Interactive comment on Atmos. Chem. Phys. Discuss., 12, 18163, 2012.