

Interactive comment on “Technical Note: A combined soil/canopy chamber system for tracing $\delta^{13}\text{C}$ in soil respiration after a $^{13}\text{CO}_2$ canopy pulse labelling” by M. Barthel et al.

M. Barthel et al.

mbarthel@ethz.ch

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Response to Reviewer Comments

We would very much like to thank Michael Bahn and the two referees for their effort and time to review our work.

Both reviewers criticize the alleged novelty of the introduced chamber system. According to their point of view, combined soil/canopy chambers have been used for a long time by other groups, for instance, by Kuzyakov et al. (1999) or Pumpanen et al. (2009). We agree that a dual compartment approach itself is truly not an innovation. Our intention here was rather to introduce a fully automated measurement setup, which is able

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to (1) measure continuously fluxes of CO₂ and its stable isotopes (¹³C and ¹⁸O) in the canopy and soil compartment (2) while performing a ¹³C canopy pulse labeling (3) avoiding contamination of the soil matrix after ¹³C canopy pulse labeling and 4) quantifying simultaneously ecophysiological and environmental parameters (transpiration, temperature, humidity) on the canopy level.

We are aware that the showed results are only few in terms of ecophysiology, but here they were mainly intended to show the advantages of the introduced measurement setup in a technical note. Therefore, we also decided to implement the one replicate which was leaky, not only to draw attention to possible pitfalls, but also to show that certain physiological conclusions cannot further be assessed.

Another major issue, which has been raised by both reviewers, was the small number of replicates achieved in this study. Indeed, the number of replicates seems to be little at the first glance, especially when conducting laboratory experiments. However, there was a trade-off between accuracy/frequency and number of replicates to be made, when considering, that 12 chamber measurements (6 soil/ 6 canopy) plus reference measurements which had to be done for one complete measurement loop within one hour.

Please also note the supplement to this comment:

<http://www.biogeosciences-discuss.net/7/C1167/2010/bgd-7-C1167-2010-supplement.pdf>

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