

## ***Interactive comment on “Overestimation of closed chamber soil CO<sub>2</sub> effluxes at low atmospheric turbulence” by Andreas Brændholt et al.***

**Andreas Brændholt et al.**

andbr@env.dtu.dk

Received and published: 12 December 2016

We thank reviewer 1 for the review and comments, and we appreciate the reviewer's positive opinion towards the manuscript. We would like to comment on the following specific concern put forward by the reviewer:

“One concern I have with this approach is that it might be possible for some fresh air being pushed into the soil profile by the fan, leading horizontal advection of air movement in the soil around the chamber, which would cause loss of respired CO<sub>2</sub>. This might be another reason why authors see lower measured soil CO<sub>2</sub> flux (Fig. 9) even under high turbulent condition when the fan is used.”

We agree with the idea put forward by the reviewer, and think it falls well in line with the third explanation that we proposed for the lower fluxes with a fan, even under high

C1

turbulence (see page 12, line 18 to page 13, line 4).

In the manuscript we discuss if using a fan not only eliminates the effect of low atmospheric turbulence, but also introduces a new potential bias of higher than ambient atmospheric turbulence, which could explain the lower fluxes seen even during day-time when atmospheric turbulence generally was high. We hypothesize that the lowering of chamber day-time fluxes might be due to lower wind speed in the chamber during a measurement compared to the outside, when the fan is used. The lower fluxes measured under these conditions may therefore be explained by the general relationship between wind speed and soil fluxes estimated with chambers reported in the literature.

---

Interactive comment on Biogeosciences Discuss., doi:10.5194/bg-2016-490, 2016.

C2