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Interactive comment on “Quantitative estimation and vertical partitioning of the soil carbon dioxide fluxes at the hillslope scale on a loess soil” by F. Wiaux et al.

D. Obrist (Editor)

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Dear Dr. Wiaux,

I have now received three reviews on the paper entitled “Quantitative estimation and vertical partitioning of the soil carbon dioxide fluxes at the hillslope scale on a loess soil”. All three reviewers expressed serious concerns about the novelty of the findings of this paper, in particular in lieu of three other manuscripts that are published and/or are in review reporting results from the same field study. All reviewers also commented about the extensive length of this manuscript and the lack of clear focus. At the same time, all reviewers are in support of the high quality and technical aspects of measure-

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ments.

I would like to give the authors the opportunity to respond to these reviewer comments prior to submitting a revised manuscript, and in particular detailing: how the authors intend to address the reviewer concerns; how they intend to significantly shorten the manuscript; and most importantly, how they intend to restructure the manuscript to clearly set it apart from their other publications. My recommendation is that in a revised manuscript, the authors focus on the vertical patterns of CO₂ gradients, the vertical partitioning of CO₂ fluxes, and the respective physical and environmental controls as well as linkages to vertical patterns of OM reported elsewhere. I therefore suggest to eliminate modeling components for long-term CO₂ fluxes based on the RothC modeling approach and its comparison to surface fluxes as measured by chambers (similar to reviewer 3 suggestions). I agree with both reviewers 1 and 3 that the vertical flux partitioning results and the controls on CO₂ pore concentrations (this paper) has significant overlap with a paper that is in review (“New insights in the calculation of soil carbon dioxide fluxes by means of the gradient method”; *Europ. J. of Soil Sci*; as well as another manuscript entitled “Calculation method of carbon dioxide fluxes along soil profiles” that was just submitted for review to *Biogeosciences* as a companion paper”). I assume that these two manuscripts are the same, and that maybe the *Biogeoscience* companion paper has been submitted after a rejection in the *European J. of Soil Sci*? I suggest to include relevant components of this second manuscript into the existing manuscript to avoid duplication.

With best regards, Daniel Obrist

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