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Interactive comment on "Inferences from CO_2 and CH_4 concentration profiles at the Zotino Tall Tower Observatory (ZOTTO) on local summer-time ecosystem fluxes" *by* J. Winderlich et al.

Anonymous Referee #2

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General comments:

The paper provides unique CO2 and CH4 biosphere-atmosphere exchange estimation for a region from where such data have been hardly available while the region plays a crucial role in the global atmospheric CO2 and CH4 budget. The study presented in the paper uses the available tall tower concentration measurements to estimate the net CO2 and CH4 exchange. It is a pity, that only nighttime surface-atmosphere flux data can be estimated with acceptable uncertainty yet, therefore, the use of the results in budget studies is limited. The paper is well written and may be accepted for publication after revision. I have only a few comments, partly concerning certain scientific questions, partly of technical character.

Comments:

Page 15346-15347, Section 2.3: Footprint of the measurements depends on the elevation above the ground. A few words would be desirable on how big the difference may be and how much this difference may influence the results of the calculations.

Page 15346, line 23: What kind of 'ECMWF meteorology' was used? (Although the meaning of the abbreviation 'ECMWF' is well known among the professionals, the full name of the organization may be given in the paper for completeness.)

Page 15347, line 12-16: The second sentence lists the fetch areas of the towers in the opposite order than the first sentence lists their heights. It would be more logical to use the same order.

Page 15349, line 24-29: The method applied systematically underestimates the CO2 sink capacity of the region in the afternoon hours. The reason is understandable but this bias also distorts the monthly and annual integrated NEE frequently used in budget calculations, which is not good news. Could the magnitude of the bias be estimated using the new CO2 eddy covariance measurements? Could the shape of the mean diurnal variation of NEE measured by the eddy covariance system used retrospectively for the correction of the afternoon NEE values calculated from storage? (If the noontime minimum NEE and the evening NEE are reproduced more or less correctly by the storage method, the afternoon values might be interpolated using the mean diurnal variation as the interpolation function.)

Page 15350, line 12-13: variing -> varying, widly -> widely

Figure 3: legend is missing

Figure 5: ...and years (to be consequent with the captions of Figs 3 and 4)

Figure 10: Why are the data for 16:00-6:00 missing? I would expect a figure similar to Figure 1.

Interactive comment on Biogeosciences Discuss., 10, 15337, 2013.