

Reply to the review of Anonymous Referee #2

The authors would like to thank anonymous referee #2 for the positive comments. In the following, referee's comments are given in bold, author's responses in plain text. Suggested new text is quoted in italics together with page and line numbers.

The authors instrumented a radio tower in Beromünster (Switzerland) for measurement of atmospheric CO₂, CH₄, and CO mixing ratios at 4 different height levels up to 212.5m above ground. They analyze the first 2 years of high-frequency measurements with respect to growth rate, seasonality, mean diurnal cycles, and tracer-tracer correlations. From the vertical profiles, they calculate storage fluxes as a proxy of local surface sources/sinks. All the results are compared to other tall tower measurements and to information about local/regional tracer fluxes, and discussed in terms of their implications for the processes causing the observed trace gas variations.

I find this an important and interesting work, adding information to better understand the highly complex cycles of greenhouse gases in Europe. In addition to the information on the local/regional trace gas processes, the setting up and operation of this tall tower site is a very valuable contribution to the continental and world-wide observation network.

Its value will even increase further with continuation of the measurements. The paper is very well and clearly written. I like the concise language and the way the authors put their work into context with other observations and the European greenhouse gas cycles. I clearly recommend this work for publication in Biogeosciences.

Except for very few very minor suggestions below, I have no comments to add.

Minor comments:

p2 line 20: remove spurious "were"

p3 line 14: clarify the measurement schedule by adding "...was conducted **successively****..." (if that is what you did).**

p4 line 21: It seems that "For the estimation ..." starts a new topic, which could be clarified by a new paragraph.

p5 lines 6-15: I feel it would be good to make the meaning of the storage flux clearer. If I understood the meaning correctly, it might suffice to add in lines 14-15 "**surface**** source" and "****surface**** sink".**

p8 line 6: you probably mean singular "maximum"

We do agree with the suggestions above, the changes will be made in the manuscript accordingly.

p12 lines 16-19: Mention where the Winderlich et al measurements were done

The sentence will be rearranged accordingly, page 12 (line 16):

"The diurnal variations of fluxes in Beromünster are similar to those obtained at the Zotino Tall Tower Observatory (ZOTTO; 60° 48' N, 89° 21' E) in Siberia (Winderlich et al., 2014)."

References:

Winderlich, J., Gerbig, C., Kolle, O., and Heimann, M.: Inferences from CO₂ and CH₄ concentration profiles at the Zotino Tall Tower Observatory (ZOTTO) on regional summertime ecosystem fluxes, *Biogeosciences*, 11, 2055-2068, 10.5194/bg-11-2055-2014, 2014.