Review of Liu et al.: Spatiotemporal patterns of the fossil-fuel CO2 signal in central Europe: Results from a high-resolution atmospheric transport model (R2)

General comments: the authors have addressed most of the comments that I had for the first round of the review. However, there are still some points that are not clear to me. I would recommend the manuscript to be published after the authors address the comments below.

Major comments:

- Time functions:

  I have pointed out this issue in the first round of the review. The authors have added Equation 2 in the revised manuscript correspondingly. First of all, in Eq.1, what is the range and total number of "t"?

  The mass conservation of carbon is critical in the downscaling approach. At the same time, simple downscaling approach using time functions likely leads the "stair-stepping" behavior between months (See Figure 1 in Fisher et al., 2016). Can the authors zoom in Figure 2 just to show the transit between two months to see if the "stair-stepping" behavior exists in the approach they applied? If it doesn't, I would like to know more details about how the authors reconcile this behavior. If it does, I would like to see more discussion on how this issue affects/biases the results.

- In the revision, the authors have done all of the analysis based on the full time series of the period of interest to have the consistency for the entire manuscript. However, it is well known and also showed in the manuscript that the nighttime CO2 signals are much larger than the daytime ones. In the section of discussion, the authors have discussed the availability of the detection of the satellite measurements to the reduction of 30% of the fossil fuel. Apparently, the authors understand that the existing CO2 satellite (e.g., GOSAT and OCO-2) sample CO2 around 1pm local time. In the case, further discussion based on the results of the full time series is not appropriate any more. Although the result won't change the main conclusion (the gradient and variability of XCO2 will be even less according to Figure 14), cautious clarification is needed here.

  Minor comments:

1. Line 65, removed "fully". I still don't think "fully" can be used in this context.
2. Line 270 and below, apparently, the correlation between observation and model results becomes smaller after the authors use the full time series instead of daytime only. Do all of the values the authors listed pass the significance test at $P > 0.005$? I am suspicious about 0.57 and 0.63. Can the author clarify it?
3. Line 515, can the authors briefly explain what the "other factors" are? And how?
4. Figure 8, a different method is needed here to present the contribution of each component to the total. It is confusing to me the total contribution of each could be larger than the total (a).

References:

Fisher, J. B., Sikka, M., Huntzinger, D. N., Schwalm, C., and Liu, J.: Technical note: 3-hourly temporal downscaling of monthly global terrestrial biosphere model net ecosystem exchange, Biogeosciences, 13, 4271-4277, https://doi.org/10.5194/bg-13-4271-2016, 2016.