

Interactive comment on “Greenhouse gas observations from the Northeast Corridor tower network” by Anna Karion et al.

Anonymous Referee #1

Received and published: 19 December 2019

Karion et al. describe a tall tower network for the Washington, D.C., and Baltimore area for measurements of CO₂ and CH₄. The goal of the network is to provide CO₂ and CH₄ data to constrain models that quantify GHG emissions from northeastern U.S. metropolitan areas. They further describe a thorough uncertainty analysis for their measurements, especially when limited by the number of calibration standards they are able to use, as well as a future plan for determining uncertainty. Finally, they present some initial data from the network, showing how the vertical gradients in CO₂ and CH₄ are influenced by some of the sources and sinks surrounding the tower locations.

Overall, this paper provides a good description of the measurement network that will hopefully be used for many years to come. It is certainly worthy of publication in this journal. I only have a few minor comments, listed below.

C1

My only real complaint/disappointment with the paper has to do with the re-calibration of the standard gases by NOAA GMD. I wonder how drift in the calibration standards would affect the uncertainty calculations. However, this is probably a subject for a future paper, not this one.

line 13, I think of the “network” referring to the stations, not the measurements themselves. Perhaps use “observation stations” instead of “observations”?

line 16, suggest “northeast U.S.” instead of “US northeast”

line 49, “powerplants” should be two words

Table 1, I’m not sure (mm/yyyy) is necessary, especially since the one digit months do not have a 0 in front. I suggest (mo./yr.)

line 135, suggest “sample” rather than “pull air”, and remove “one” from the sentence.

line 141, I assume that’s also OD

line 147, this looks to be a Picarro. I’d mention that, since the authors have mentioned the other companies (Valco, Permapure, etc.)

line 190, suggest “12C/13C ratio in CO₂” for the general readership

line 278, in the equation “m + b = 1”, is that a lower case “L” or a “one”? I assume it’s a “one”, but it’s confusing, because later in the sentence the “SDC,cal = 1” is clearly a non-italicized “one”.

line 346, suggest “analyzed” instead of “measured”

line 508 and elsewhere, suggest “by Verhulst...” line 560, it seems these numbers should have negative signs to be consistent with Figure 9.