

Atmos. Chem. Phys. Discuss., referee comment RC2 https://doi.org/10.5194/acp-2022-720-RC2, 2022 © Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.

Comment on acp-2022-720

Anonymous Referee #2

Referee comment on "Disentangling methane and carbon dioxide sources and transport across the Russian Arctic from aircraft measurements" by Clément Narbaud et al., Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2022-720-RC2, 2022

General comments

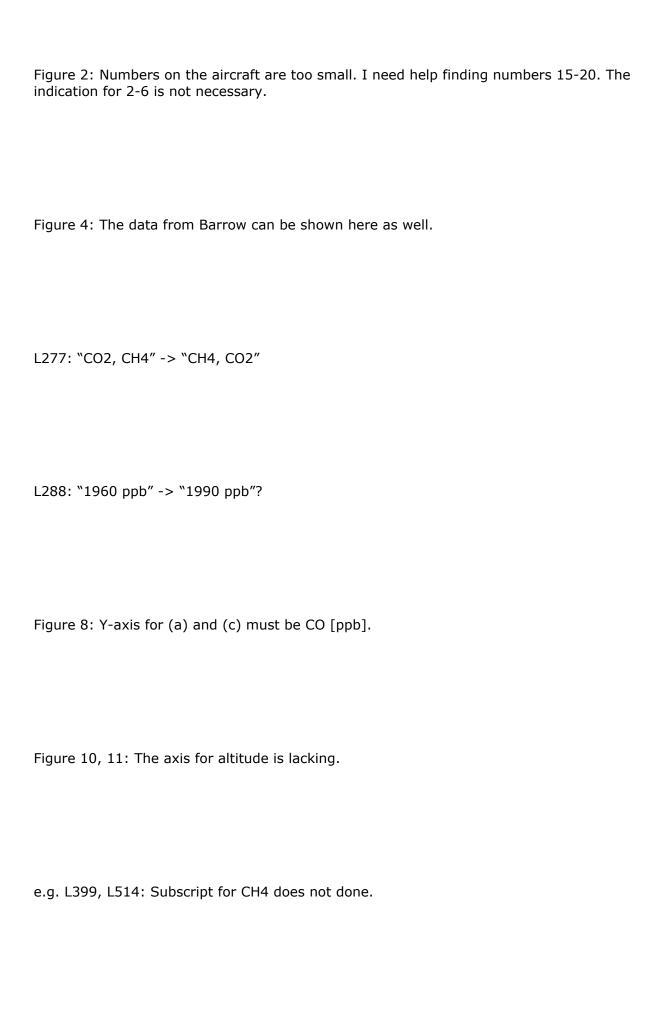
The paper tries to capture CH4 and CO2 characteristics in Russia with several observation flights in September 2020. Using tracer gases (CO and O3) and footprint analysis, the authors investigated the cause of variation for the gases. Observation over Eurasia is limited, particularly aircraft observation; thus, the data is valuable for this research field.

However, although the data could be used to validate any transport model output, a snapshot of one month's data is difficult for meaningful analysis for GHG research. I need clarification on the new findings. In some chapters, statements are too ambiguous and contain too many guesses without probable evidence.

Specific comments

L378-379: Then, what is the reason for CO₂ enhancement?

L379-380: Any explanation is needed for the different tendencies between low and high.
L380: What is the meaning of 8.5 ppb CH4/ ppm CO2?
L458: Please rephrase the sentence.
L462-463: Why no simulated wildfires contribution?
Technical corrections
Figure 1: Letters, mainly yellow, are too small.



L569: "Anokhin" -> "Antokhin"?