

The authors have addressed the points raised by the previous reviewers well. The significance and novelty of the manuscript is clear and the quality of the manuscript is improved. I only have some minor suggestions to be checked before publications.

Thank you for your feedback.

L8-9: “We combined our new measurements with the last published database of CH<sub>4</sub> isotopic signatures, as well as with additional literature, and present a new global database.” → “We combined our new measurements with the previously published database of CH<sub>4</sub> isotopic signatures, and present a new global database.”

We have partly changed the sentence following your suggestion, but we want to clearly state that additional data from the literature was also added.

L55: “database can be completed” → “database can be improved”

This was changed accordingly.

L73-74: “We also searched the literature for more measured CH<sub>4</sub> source signatures to add to the dataset.” → “We also included the measured CH<sub>4</sub> source signatures from other literature.”

Thank you for your suggestion, the sentence reads better and was changed accordingly.

L354: “The new data” → “The new dataset”

This was changed accordingly.

L362: “utilizing both  $\delta_{13}\text{C}$  and  $\delta_2\text{H}$  for CH<sub>4</sub>”

Do you perhaps mean “utilizing both  $\delta_{13}\text{C}$  and  $\delta_2\text{H}$  of CH<sub>4</sub> measurements”, “utilizing both  $\delta_{13}\text{C}$  and  $\delta_2\text{H}$  for CH<sub>4</sub> emission estimates” or something else?

Thank you for spotting that mistake. We meant “utilizing both  $\delta_{13}\text{C}$  and  $\delta_2\text{H}$  of CH<sub>4</sub>” and it was changed in the new version of the manuscript.

Notations: Sometimes you use “ $\delta_{13}\text{C}_{\text{CH}_4}$ ”, and sometimes “ $\delta_{13}\text{C}$ ” (similarly for  $\delta_2\text{H}$ ). Unless you

intended, please remember to synthesize all the notations.

All the notations have been revised.

Figure 5: Could you replace labels (a) and (b) to e.g. bottom/top of the panels? Now it looks as if (a) for top-left and (b) for top-right only, rather than columns. Alternatively, you could consider adding (c) and (d).

We chose to use a, b, c and d. A new figure and caption are in the new version of the manuscript.