**Response to referee comments on "Satellite quantification of oil and natural gas methane emissions in the US and Canada including contributions from individual basins"**

We thank the two referees for their careful reading of the manuscript and the valuable comments. This document is organized as follows: the Referee's comments are in *italic*, our responses are in plain text, and all the revisions in the manuscript are shown in blue. **Blue text** here denotes text written in direct response to the Referee's comments. The line numbers in this document refer to the updated **WORD** manuscript.

**Reviewer 1**

*Line 87: "−3.4 ± 5.6" and "US (Lorente et al., 2020)*

**Response**. We have updated the reference. Thanks.

*Line 113: Please provide the link (way) to access the Enverus DrillingInfo. Line 178: "XCH4" should be "XCH4".*

**Response**. Corrected, thanks.

*Line 389: Does the "R" represent the correlation coefficient?*

**Response**. We have clarified it in text, thanks.

**Reviewer 2**

*The line numbers refers to the tracked version of the manuscript.*

*Line 375: It was referred to as "line 385" in the responses. The newly added statement "The posterior corrections from using wintertime data are slightly different in Canada and Northeastern US because of the low observation density and low averaging kernel sensitivities" seems cursory and not exactly accurate. The western Canadian basin moves downwards in DJF and SON, upwards in MAM; the Marcellus moves downwards in DJF and MAM but upwards in JJA and SON (quite significantly with large AK sensitivity). Do those indicate anything about the seasonality of assumed emissions? I assume only an annual mean emission is inverted. Please clarify.*

**Response**. Now we clarify this in the text.

Line 241. We also calculated posterior emissions from the O/G sector using TROPOMI observations in different seasons. Here the prior O/G emissions remain constant over different seasons, so any changes in the posterior correction factors are determined by the inversion of the satellite data.

*Please provide the Varon et al. 2022 reference.*

**Response**. Added, thanks.

*Figure 4: R is shown in the figure but the caption still says R2.*

**Response**. Corrected, thanks.