

Interactive comment on “Ship-borne measurements of XCO₂, XCH₄, and XCO above the Pacific Ocean and comparison to CAMS atmospheric analyses and S5P/TROPOMI” by Marvin Knapp et al.

Anonymous Referee #2

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Knapp et al's manuscript "Ship-borne measurements of XCO₂, XCH₄, and XCO above the Pacific Ocean and comparison to CAMS atmospheric analyses and S5P/TROPOMI" is an excellent piece of work describing ship borne measurements of total-column CO₂, CO, and CH₄ gathered during a transect across the Pacific Ocean at ~30 deg N. There is a focus on the technical aspects of protecting and successfully deploying a solar-observing Fourier Transform Spectrometer in this challenging environment. There is also a satisfactory description of the trace gas retrieval process and bias correction efforts. Comparisons to both TROPOMI satellite observations, as well

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as to CAMS model fields, are also described in detail. As the ocean environment is a measurement poor region for validation of our global models, this work is significant and very worthy of publication following a few minor technical corrections listed below.

The EM27/SUN data is made available by the authors; however, this reviewer struggled to quickly locate and download the exact CAMS product used for both the retrieval a priori and for the final comparison. If this was a special product produced for this campaign then that should be stated clearly and the data should be archived along with the EM27/SUN measurements. Or, if the model fields used are a standard product that I simply overlooked, I suggest including a link to the exact data.

Technical corrections:

L10: is found TO BE 0.24 ppm

L45: Agree with Reviewer #1 – change "disposes of"

L101: I assume the authors are stating that the ventilation takes up 160W when the electronics are running at full power? – this should be made clearer if so.

L147: Is the factor of 0.9693 simply an empirical correction? Is there a physical justification for it?

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