

Interactive comment on “Enhancing the capabilities of a portable FTIR spectrometer for greenhouse gases measurements by addition of a second detector channel for XCO observations” by F. Hase et al.

Anonymous Referee #2

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The paper describes the capacity of measuring XCO by adding a second detector channel to the existent portable FTIR spectrometer (EM27/SUN). Simultaneous monitoring of XCO with XCO₂ and XCH₄ is relevant for satellite validation and sources attribution.

Although the paper well describes the new instrumental set-up, results do not support the conclusions. The results need to be enriched by more quantitative and thorough comparisons between the prototype instruments and other reference sensors. Descriptions of comparisons should be strengthened: instead of comparing time series,

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I would recommend using 1:1 (or scatter plots type) plots for more clarity and quantifications of the results. Section 5 should be improved and organized in sub-sections for more clarity.

I recommend publication of this paper in the AMT journal when comments are addressed.

- Why only using 6 days for the comparisons? Is it statistically adequate? Please comment.
- Use scatter plots (or other) for Fig 8, 9, 11, and 12, instead of time series. Why the TCCON data are not used as a reference for such a validation. These data should be added to the comparison plots. Why not comparing XCO₂ as well?
- Avoid the word “excellent agreement” in the actual comparisons.
- What is the precision of the prototype XCO, XCH₄, and XCO₂? How these precision compared to standard EM27/SUN?
- In figure 11, the agreements for last 3 days are different than the others days. Could you explain?
- Figures 5 and 6 can be combined together.
- Table 1 and 2 should be re-organized in one Table.
- Figure 7, could you add the interfering species in the window?
- Figure 9 shows the total column of CH₄, not XCH₄.

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