

Interactive comment on “A compact QCL spectrometer for mobile, high-precision methane sensing aboard drones” by Béla Tuzson et al.

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This is an excellent paper describing a truly impressive accomplishment: the dramatic miniaturization of a laser based trace gas monitor with very little sacrifice to measurement accuracy. The results are convincing and the paper is very well written and should certainly be published. I have a few small suggestions for the authors to consider but the suggestions are not mandatory.

1) Taking advantage of the surprisingly narrow water line is very clever. However, the discussion describing why this line is narrow is not clear. Does it simply have a small broadening coefficient or is it narrow because of Dicke narrowing which does not, I think, involve energy level spacings. Or is it both? It would be nice to clarify this

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discussion or remove it if the explanation is not clear.

2) It is a little surprising to me that the detector temperature has a strong effect on the reported mixing ratio. Do the authors have an explanation for this? Changes in linearity or bandwidth, perhaps?

3) The statement near the end of Section 3.1 that the remaining temperature artifacts "most likely reflect the susceptibility of the entire electronics to abrupt temperature changes" seems unsupported. Do the authors have a reason for believing that the problem could not be due to an optical effect? If so that should be stated. If not, then perhaps it would be better not to speculate.

4) Figure 6 shows a comparison between the compact QCL monitor and a Picarro monitor. The scale is so large that it is difficult to see the discrepancies. It would be useful to add a trace that shows the difference between the mixing ratios reported by the two instruments.

Again, this is an excellent paper and a great accomplishment!

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