

Interactive comment on “Simultaneous Detection of C₂H₆, CH₄ and $\delta^{13}\text{C}$ -CH₄ Using Optical Feedback Cavity Enhanced Absorption Spectroscopy in the Mid-Infrared Region: Towards Application for Dissolved Gas Measurements” by Loic Lechevallier et al.

Anonymous Referee #2

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This article presents an OF-CEAS based mid-IR interband cascade laser spectrometer for the simultaneous measurement of [CH₄], [C₂H₆], and $\delta^{13}\text{C}$ -CH₄. It is targeted to concentration ranges for CH₄ and C₂H₆ as they are found in seawater. The manuscript is well written and structured, and the results are presented in a clear and concise fashion. I recommend publication in AMT after the authors have addressed a few minor points listed below.

page 2, line 27: in the text the ICL is said to be from Nanoplus, but in figure 1 you write NanoGiga.

page 3, line 6: there are a few different procedures to compute the signal used to steer the piezo-mounted mirror (to control the OF phase) (e.g. "asymmetry" of the modes etc.). Which one is used here?

page 4, line 8: what lineshape do you use for the spectral fit? Voigt? Could some of the issues mentioned later (i.e. dependence of $\delta^{13}\text{C-CH}_4$ on $[\text{CH}_4]$) come from this choice?

page 4, line 14: after the 200 spectra are acquired, how are they interlaced? I.e. how do you know by how much the cavity modes of the n-th spectrum are offset from the (n-1)th spectrum?

page 4, line 31: is the exponent of your NEAS correct? should it not be -11 (per spectral point)?

page 5, line 14: what are line "surfaces"?

page 5, line 21: you say the positions of the cavity modes are "locked", but relative to what? To the time axis of each scan (i.e. the cavity modes should always occur at the same time relative to the start of the tuning ramp)?

page 5, line 27: I think you mean at 17h30 (not 14h30)

page 11, figure 1: solenoid (not solenoide)

page 12, figure 2: subscript the "4" in CH₄ in the caption.

page 13, figure 3: you could use the same y-axis for the top panel (just a suggestion)

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Discussion paper

