

Interactive comment on “A decade of CH₄, CO and N₂O in situ measurements at Lauder, New Zealand: assessing the long-term performance of a Fourier transform infra-red trace gas and isotope analyser” by Dan Smale et al.

Anonymous Referee #1

Received and published: 9 November 2018

This paper describes the history and technical aspects of an in situ analyser that has been running in Lauder, NZ since January 2007. The spectrometer measures a variety of trace gas species, but this paper focuses on methane, carbon monoxide, and nitrous oxide. This paper describes a high quality, unique dataset that promises to be very valuable to the scientific community.

General comments:

The paper is well written, although it is quite long and reads much like a technical report

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or detailed owners manual. The most interesting parts of the paper (in my opinion) are sections 1, 5.12, 6, and 7. I was unable to determine why some sections of the paper were put into appendices whereas other sections were not. I recommend that the authors consider putting more of section 5 into appendices, and in the main body state only information that is required to understand the time series analysis.

Specific comments:

P2L12: You may want to motivate your work by reminding the reader that there are few emissions in the SH, so these SH mid-latitude measurements are crucial for pinning down the true background values.

Technical comments:

P14L17: Did you also assess the modulation efficiency of the FTIR, along with the phase and FOV?

P15L25: I would have liked to see more of these linear regression curves. You show one in the appendix, so either refer to that figure or plot a few more here.

P16L8: You have not yet defined QC/QA.

P16L23: How do you determine RCSp?

P18L3: retrieved dry mole fractions *to* that of the assigned

P18L5: Do you mean to refer to Eqn (2)?

P19L28: A step change is an indication *of* an acute incident

P22L27: Suggestion: "Our approach is to take regular measurements..."

P26L16: This approach would *be* need*ed* when comparing...

Figure captions: Please make the figure captions self-explanatory. For example, Fig 10 shows scaling factors, but does not discuss what is being scaled.

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Fig 17: I had trouble seeing the blue triangles. Could you make them bigger?

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2018-274, 2018.