

Interactive comment on “Comparison of cavity enhanced optical–feedback laser spectroscopy and gas chromatography for ground-based and airborne measurements of atmospheric CO concentration” by Irène Ventrillard et al.

Anonymous Referee #1

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The paper "Comparison of cavity enhanced optical–feedback laser spectroscopy and gas chromatography for ground-based and airborne measurements of atmospheric CO concentration", by I. Ventrillard et al., describes a comparison between an old and well known technique, namely gas-chromatography, and OF-CEAS, when atmospheric CO is the target molecule, both on the ground and on board a small aircraft.

The work is based on data acquired several years ago, which had to be treated in order to be fully comparable, with recently developed methods.

The paper is clear and well written. This reviewer advises publication of the paper,

once a few points are improved and some typos are corrected.

Page 2, line 10: though based on an "old" spectroscopical technique, an in-situ diode laser based CO analyzer has been deployed on board of the Geophysica aircraft since 2005, with performances comparable to those of the described device: S. Viciani, F. D'Amato, P. Mazzinghi, F. Castagnoli, G. Toci, P.W. Werle: "A cryogenically operated laser diode spectrometer for airborne measurement of stratospheric trace gases", Appl. Phys. B 90, pp. 581-592 (2008). Moreover, analyzers by different firms, (Aerodyne, for instance), use direct absorption in the middle infrared, as very often in this spectral region, and at the target concentrations, few tens of meters are sufficient for measurements at the same level of LOD, resolution and accuracy of the submitted paper. In principle, a good advantage of OF-CEAS, with respect to the above work, is the possibility of using lasers emitting closer to the near infrared, despite the weaker absorption bands. In this wavelength region all the components are generally more user-friendly (and cheaper) than in the middle infrared. Yet, in page 10, lines 5-10, the authors claim (correctly) that any kind of laser (including QCL and ICL, both in the middle infrared) can fit this technique. This reviewer would appreciate a short, further discussion about the motivation for the use of OF-CEAS, in order to provide a clearer picture of the field of application of this technique.

Page 5, line 11: it would be useful to show here Fig. 1 of Kassi et al. (2006), as many readers probably would not go and check that reference, and could ask themselves how to fit a 50 cm cavity (plus some optics) in a 48.26 cm wide rack.

Page 7, line 8: the volume of a 3/8" pipe, 20 m long, is about 1400 cm³. With a flow of "250 sccm" it would take more than 5 minutes to cross the entire pipe length. Could the authors explain their statement?

Typos

Page 3, line 22: "to obtained" should be "to obtain"

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Page 5, lens 31 and 32: if ProCEAS is the name of a device, we should have "works" and "reaches"

Page 7, line 3 must be properly formatted

Page 7, line 6: "idenpendent" should be corrected

Page 7, line 23: "close" can be omitted

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