

Interactive comment on “A novel instrument for measurements of BrO with LED based Cavity-Enhanced Differential Optical Absorption Spectroscopy” by D. J. Hoch et al.

Anonymous Referee #1

Received and published: 11 July 2013

This manuscript is an improved version of an earlier paper in this journal (AMTD 5, 3079–3115, 2012). A larger part of the concerns by the reviewer have been addressed in the new version. However, the general concern if the novelty of this manuscript is sufficient to justify publication in this journal remains (see reviews to AMTD 5, 3079–3115, 2012). The scientific quality of the paper has been improved and most important the authors give better evidence that the instrument can measure BrO accurately.

Specific new points:

Title: “Spectroscopy” instead of “Spectroscopy”

C1593

p6049 l1: make “3” a subscript of “O3”

p6049 l28ff: Although the authors surely correct that CRDS instruments which apply a single wavelength are limited with respect to their specificity, I would not call it a shortcoming. It only limits their applicability.

p6050 l1-3: The authors refer aerosol extinction only to absorption mentioned in the sentence before. Please rephrase.

p6050 l3: What chemical reactions are the authors thinking of, when they state that a closed resonator is a risk? Please specify.

p6050 l23-25: This statement is contradicting the statement on p6051 l1-2, where the authors state the system by Grilli et al. is suitable to perform field measurements. Please make this consistent.

p6051 l1-14: The authors mix up statements about CIMS instruments and the CE instrument by Grilli et al. in this section. It would be much easier to read, if this was clearly separated.

p6051 l12: Better say “by an optimized CIMS instrument with a short inlet”.

p6052 l11: Please add the species that were measured by the White-cell DOAS system.

p6053 l2: I assume that *λ does not belong to the subscript*.

p6057 l6: Why is it important to detect ozone? The detection limit is far away from being useful for atmospheric measurements. Please justify your statement.

p6057 l15: There is one more right parenthesis than left ones.

p6057 l21: “for” is not needed here.

p6059 l18: “control” instead of “controll”

p6059 l21: “receives” instead of “receive”

C1594

p6060 I1: Please give a typical number for τ_1 . How stable is τ_1 over time? Please state more precise what determines τ_1 instead of giving a general description as “electro-optical” decay.

p6060 I1-12: I do not think that this part is appropriate for a section named “Software”. It does not describe a software, but gives information how useful (or not) the CRD mode of the instrument is.

p6061 I3-4: It sounds trivial that a change in the path lengths in the different set-ups is useful to have different cavity lengths. Please specify precisely why it is useful to have different cavity lengths.

p6068 I1: “is” instead of “are”

p6068 I17-18: Regarding the high detection limits for O₃ and HONO I do not see the advantage of being able to measure different species simultaneously. Except for laboratory experiments with exceptionally high concentrations, the ability of the instrument to detect O₃ and HONO will not be useful. Please justify your statement.

p6068 I25: Please add the time resolution of the DOAS White system, so that the reader can compare numbers.

Fig. 11/12: Error bars of the WS-DOAS in Fig. 11 and error bars of the CE-DOAS in Fig. 12 are much larger than the scatter in the data suggest. Please discuss reasons why this is the case and discuss the influence of the unrealistic large error bars on the fit results, since the fit procedure takes error bars in both coordinates into account.

Interactive comment on Atmos. Meas. Tech. Discuss., 6, 6047, 2013.