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Atmospheric Measurement Techniques Discussions

Interactive comment on "Development of an incoherent broadband cavity enhanced absorption spectrometer for in situ measurements of HONO and NO_2 in China" *by* Jun Duan et al.

Anonymous Referee #3

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The paper describes an optical instrument for measuring concentration of HONO and NO2 in the atmosphere. The instrument can be put on a mobile platform and results using such a platform are presented. I think that the main shortcoming of the paper is that the authors do not make sufficiently clear what it is that is new about their instrument. Is it the choice of wavelength that enables O2-O2 to be used as a gas to measure the effective cavity length? Or is it a series of incremental changes that allow it to be used outdors in dirty, vibrating or temperature varying environments? Other instruments of the same kind are described, but little that is specific is said about their shortcomings, and how this instrument overcomes these issues.

Some more specific issues follow: I agree with the other referee that this is not an instrumrnt just for China - surely it is for the world?

The authors should delete the words "home made" - this is not very positive, and the fact that they have made the instrument is enough.

In the abstract, sentence 3, some rewording is in order. Instruments don't make significant improvements, their makers do.

One of the references is incomplete (J et al.) and the reference to Krauss is quite insufficient for a reader to follow up.

In section 2.1 the Beer-Lambert law ought to be quoted so as to properly introduce extinction. There is also something odd about the sentence order, where sentence 3 seems out of place in between two others on extinction.

Similarly in section 2.3 the order in which the concepts are presented seems odd. It would be improved if the two paragraphs were swapped, but it could probably do with more work.

the beginning of section 2.4 is a bit ambiguous - it could be construed that the current IBBCEAS is not the improved one, but that the improved one is a different one. Also, what is "temperature resistance"? Is it the reciprocal of thermal conductivity? Sentence 2 of this section is vague; what changes? How much?

The lines after equation 2 are hard to follow as there is an incomplete sentence - I think possibly a comma has been replaced with a full stop?

In section 3.2.2 I think there should be a reference for these absorption peaks. When you refer to particle free gasses here it suggests that there are gasses other than O2 used. Also you have not in fact shown that the purge flow is significant because you haven't given the actual physical length of the cavity.

In section 3.2.3, "detailly" is not a word in English