

## ***Interactive comment on “Toward a real-time measurement of atmospheric mercury concentrations using cavity ring-down spectroscopy” by X. Fain et al.***

**Anonymous Referee #1**

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### General Comments:

This manuscript presents a fairly detailed discussion of the development of a cavity ring-down spectroscopy technique for measuring atmospheric elemental mercury. The majority of the discussion just describes the instrument set-up. A few issues were encountered and these were clearly presented as ongoing work. A notable one is the disagree in the empirical versus theoretical determination of the Hg(0) concentration. This definitely needs to be resolved in future work. The new instrument appears to be superior to past attempts using CARDS. There really is not much to review since the manuscript is highly descriptive. Some of the figure axis labels are hard to read,

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I would increase the font size a bit. I was hoping to see a first attempt to measure Hg(0) in ambient air, but it was not included in this manuscript. To me, this would be a nice addition. Overall, CARDS now seems to be a real candidate for fast response elemental mercury measurements in the atmosphere in the near future.

### Specific Comments:

Section 3.4, p. 22154 – the perm tube was held at 50C. you sure it was not 30C? this seems like a more reasonable temperature for such a volatile species.

Section 4.2, p. 22157 – acquiring a channel difference of 0.1 ng m<sup>-3</sup> with the Tekran is not easy.

p. 22158, line 13 – reword “allowed supplying”

p. 22158, line 26 – I would remove the wording in () as it’s already provided in this manuscript.

p. 22160, line 22 – what is meant by the phrase “below-background atmospheric Hg(0) studies”?

p. 22162 – I would not rule out variations in the real Hg(0) mixing ratios. It is nearly impossible to hold it constant over half to full hour time frames.

Figure 1 – I would add to the caption that these data were obtained with a Tekran instrument to avoid misinterpretation that it was with the CARDS.

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Interactive comment on Atmos. Chem. Phys. Discuss., 9, 22143, 2009.

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