

## ***Interactive comment on “Simultaneous measurement of NO and NO<sub>2</sub> by dual-channel cavity ring down spectroscopy technique” by Renzhi Hu et al.***

### **Anonymous Referee #2**

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The paper describes a new instrument to measure NO and NO<sub>2</sub> with high sensitivity and high time resolution for future applications on board of a vehicle. The technique is based on CRDS using a laser diode at 403 nm and contains two pathways: one measuring NO<sub>2</sub> and the other measuring NO<sub>x</sub> after oxidation of NO to NO<sub>2</sub> by addition of O<sub>3</sub>. The technique is not new and has already been applied before to NO and NO<sub>2</sub> measurements with similar sensitivities and time resolution (Fuchs et al. 2009). The reliability of the instrument has been demonstrated by comparing NO<sub>x</sub> and NO<sub>2</sub> measurements for several days with CL and CEAS instruments. A first demonstration of real-time measurements onboard a vehicle is shown for a 1 hour ride through Hefei. While the paper does not give a brand new idea, it is a solid description of a new

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instrument that can be useful in future applications. The manuscript could be accepted to AMT after some English polishing. I have a few minor points:

I don't think NO<sub>x</sub> is not a secondary pollutant. Unfortunately, I have no access to the paper you cite (Crutzen 1979) in order to confirm, but I invite you to re-verify this paper to see on what basis Crutzen said that NO<sub>x</sub> is a secondary pollutant. Also, from NO<sub>x</sub> to the formation of secondary aerosols it is a long stretch, maybe it's better to remove.

Page 2, line 78: indicating several seconds in combination with high sensitivity is strange: do you mean a low detection limit with several seconds time resolution?

You give several times your ring-down times with 2-digit precision (24.12 and 22.90 $\mu$ s), however mirrors get polluted, alignment changes etc, so I guess the ring-down times you have given here are the result of one measurement at one moment? Or do you really measure over several days or weeks always exactly the same ring-down time?

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