

## ***Interactive comment on “Negligible influence of livestock contaminants and sampling system on ammonia measurements with cavity ring-down spectroscopy” by J. N. Kamp et al.***

**J. N. Kamp et al.**

jk@eng.au.dk

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> > > We appreciate the comments and suggestions from the anonymous referee that have helped to improve the manuscript.

General comment

According to the manuscript, the CDRS was calibrated under laboratory and field conditions. Due to possible interference of other compounds (water, dust, temperature) of between compounds (NH<sub>3</sub>, CH<sub>4</sub>, CO<sub>2</sub>,...), it is important to compare the specifications and performance of the instrument under field conditions by comparing results of si-

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multaneous measurements performed by using this instrument and a reference method (e.g. gas washing for NH<sub>3</sub>, gas chromatographie for CH<sub>4</sub>, N<sub>2</sub>O and CO<sub>2</sub>). This information is missing. Please add to the manuscript whether these measurements were performed (or not). If so, please report the results of the comparison. If not, please comment in the manuscript why this was not performed, and how this is going to be checked before using the instrument for real under field conditions.

> > > We hypothesize that there are no interferences in the CRDS, which we test for and validate with laboratory tests of potential VOCs interference, CO<sub>2</sub>, CH<sub>4</sub> and calibration with standard gas. We have not used a reference method as impingers or gas washing of ammonia as there are large variations in the concentration determination e.g. Misselbrook et al. (2005) report a coefficient of variance for absorptions flask of 21%. Furthermore, these methods are offline and rely on accumulation of ammonia over a long time span whereas the CRDS is running on a very different time scale, thus we do not find it suitable to use this as a reference method for the time-resolved concentration. The calibrations were conducted with a certified ammonia standard gas under a variety of conditions resembling realistic conditions, thus we find it sufficient as validation. Water, dust and temperature are mentioned as possible interfering compounds, and we have actually shown that water has a small interference in the model we are using, but this has been changed by water correction after the discoveries by Martin et al., (2016). The temperature is kept very stable at 45°C in the cavity, so temperature can only affect the sampling, which is also discussed in the introduction with the absorption of ammonia the walls and tubing. A filter removes dust mechanically, so it will never reach the cavity, and filter tests show a very small contribution from ammonia absorbed in the filter compared to the accumulated amount of ammonia flowing through the filter over a 2-week period.

Other comments:

In general, for a number of compounds the subscripts are not as subscript in the manuscript. Page 3, lines 12-15. These are results, not part or an introduction.

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> > > All subscript are corrected to the right form throughout the manuscript. We think these results from other studies highlight the importance of response times, which was addressed in previous comments from the editor.

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