

## **Ammonia emissions from air cleaners at pig farms in Denmark using a Picarro cavity ring-down spectrometer**

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Ammonia emissions from agricultural activities such as, cattle, pig and poultry farms have become an ever more important topic both for scientists as well as for regulatory bodies due to the severe impacts of ammonia on human health and the environment. In the European Union, the agricultural sector accounts for most of the ammonia emissions, and therefore the EU authorities have put in place reduction targets for the member states. In Denmark, most pig farmers have to deploy one or more ammonia abatement technologies in order to fulfill the national regulation when building new pig houses.

A promising ammonia abatement technology is partial floor ventilation and subsequent cleaning using one or two step chemical air cleaners. The cleaned air will have ammonia concentration is the sub-ppm level and with high humidity.

Here we present method of monitoring NH<sub>3</sub> emissions from air cleaners deployed on pig farms using the G2103 Picarro laser spectrometer. The Picarro G2103 NH<sub>3</sub> analyzer is a high precision cavity ring-down spectrometer using a high finesse optical cavity and a near infra-red light laser light source with a very narrow light band. The latter eliminates cross-interferences from other gases present in livestock air. Picarro instruments are built for field measurements and have been widely used for atmospheric monitoring of greenhouse gases and of air pollutants such as NH<sub>3</sub>.