Urban air pollution: Oxidized and reduced N in a real-world traffic situation

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Emissions of both particulate and gaseous air pollutants often exceed those of emission inventories like the HBEFA in urban regions. This discrepancy is probably due to the still poor information on real-world traffic emission patterns.

The project LUFTHY combined high-resolution vehicle fleet data as obtained with traffic cameras with fast-response measurements of NO_x, O_3, CO_2, particulate matter (PM) and NH_3 to improve our understanding of real-world urban air pollution patterns. The stationary campaign took place in an urban street canyon in the city center of Münster, NW Germany (51°57'48.5"N 7°37'52.9"E), for two months from September 2018 to November 2018.

Besides the often discussed traffic-related air pollutants NO_x, the NH_3 concentrations were also measured to determine the role of SCR-systems of diesel vehicles as a local source for ammonia in urban air. It is expected that significant amounts of NH_3 could be emitted from traffic due to poorly adjusted exhaust gas treatment. The results indicate significantly higher NH_3 concentrations during rush hour compared to times of low traffic density. Emission ratios for well-defined, real-world traffic situations will be presented.

On the long run, the results of this project should contribute to an improved understanding of NH_3 emissions, secondary PM formation and eventually to help mitigate urban air pollution.