PROJECT FACTSHEET

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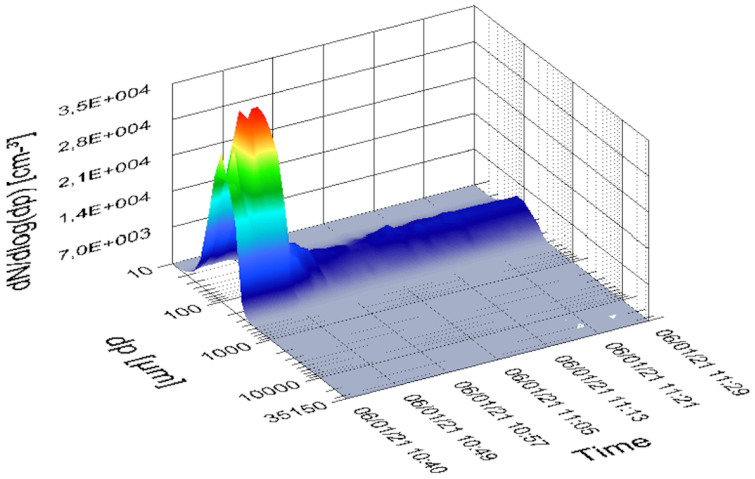
IMPLICATE

Towards a deeper understanding of the behaviour of nanoparticles from agriculture and traffic sources.



INSPIRATION

Nowadays, air quality must deal with new evolving problems effecting human health and ecosystem services on different levels. Health and environmental implications associated with high nanoparticle concentration in the lower atmosphere have prompted considerable recent research activity. Such knowledge on the exposure to atmospheric nanoparticles in urban areas is indeed of major importance to ensure public health.

Despite a considerable state-of-the-art improvement on knowledge of the characteristics of these particles, there is still a lack of information on the dispersion behaviour of nanoparticles in the near surface atmosphere. However, only a deeper understanding of these processes would enable to actively contribute to the decision-making process for regulatory thresholds concerning particle number concentration.

Furthermore, environment and agriculture also play an important role in the complex chain of emission, transmission, atmospheric chemistry, exposure and effects. Agriculture is a source of various emissions that both affect the environment (e.g. air, water, soil, plants) and individuals. More specifically, agriculture is the largest source of ammonia emissions, which is an important contributor to particulate matter concentrations by secondary particle formation.

INNOVATION

The objective of IMPLICATE is to deliver a first dataset of high frequency ammonia measurements in Luxembourg (diurnal, weekly, monthly and seasonal courses of NH_3 levels; correlation with relevant meteorological variables). This understanding process driven by LIST researchers, and based on the high temporal resolution ammonia measurements, is a prerequisite for the formulation of adequate mitigation strategies. Additionally, time series of ammonia and particle measurements will exhibit a correlation of ammonia concentrations and different size classes of the nano-particle measurements.

IMPACT

IMPLICATE will produce an unprecedented dataset of the urban environment that will open the path for the establishment of a model describing the penetration of fine particles from traffic sources into residential areas. Such a decision-support tool will not only be of high interest for urban planning measures, but also to analyse citizens' vulnerability towards nanoparticles as an emerging pollutant.

Observed emissions of ammonia levels in agricultural areas are well above the critical loads and critical levels recommended by the WHO. Based on the relationship between ambient ammonia concentration and the secondary particle formation (nanoparticles), IMPLICATE will quantify the contribution of agriculture to the overall particle emission concentrations.

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Ministère de l'Environnement, du Climat et de la Biodiversité

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