HARMO22

22nd International Conference on
Harmonisation within Atmospheric Dispersion Modelling for Regulatory Purposes
10-14 June 2024, Tartu, Estonia

SHORT ABSTRACT

Overview of content and ongoing experimental work in the international collaboration initiative MODISAFE

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Abstract text *(maximum 350 words)*

Collaborative efforts among organizations based in Sweden, Norway, France, and the UK are underway in a three-year initiative named MODISAFE. The project is dedicated to investigating key aspects of atmospheric dispersion modelling, namely deposition, evaporation, and urban dispersion. The primary objective is a comprehensive exploration of these three areas, covering theoretical frameworks, modelling methodologies, and empirical data. Notably, there is emphasis on the modelling of the governing physical processes and subsequent model validations. An essential task within the project involves experiments that address identified knowledge gaps, which more specifically are: particle deposition within a mock urban environment, evaporation dynamics of liquids from permeable substrates, and dispersion characteristics in an urban setting involving weakly positively buoyant gas. Experiments are planned accordingly for each of the three areas, contributing to the collective understanding within the scientific community.

The investigation into particle deposition focuses on horizontal and vertical surfaces composed of diverse materials, exemplified by agent fate of biological aerosols or radioactive particles dispersed in an urban context. Particle deposition experiments are planned to be conducted in the dust tunnel operated by the Health and Safety Executive (HSE) in Buxton, UK.

Evaporation from liquid drops and pools, a common source of atmospheric dispersion, presents challenges when permeable substrates like sand or asphalt are involved. To address these difficulties, evaporation experiments will be carried out under a variety of conditions at the INERIS facilities in Verneuil-en-Halatte, France.

Atmospheric dispersion in urban settings remains an important subject, frequently investigated through Computational Fluid Dynamics (CFD) simulations and wind tunnel experiments. Within MODISAFE, the emphasis is on the dispersion of gas with weak positive buoyancy in an urban environment spanning a 2 km^2 area in central Oslo, Norway. Experiments on this domain, down-scaled to a suitable dimension, will be conducted in the EnFlo wind tunnel located at the University of Surrey in Guildford, UK. Scheduled until 2025, the project aims to facilitate international collaboration and high-quality experiments in the three above mentioned pivotal areas of atmospheric dispersion research. Final results and experimental data derived from the project will be disseminated during a special session at HARMO 2025.

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Motivation

We present a joint effort to improve the knowledge in the community by international cooperation and by providing a high quality data set including experiment data from three different areas. Since this data will be publicly available it will constitute a reference material, enabling comparison and validation of models by different organizations and thereby contribute to a harmonization of the field of atmospheric dispersion modelling.