SHORT ABSTRACT

Summary of results from the Jack Rabbit III international model inter-comparison exercise on Desert Tortoise and FLADIS

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Abstract text *(maximum 350 words.)*

The Chemical Security Analysis Center of the US Department of Homeland Security Science and Technology Directorate and the Defense Threat Reduction Agency of the US Department of Defense are currently planning a series of experiments involving large-scale releases of anhydrous ammonia in 2023 and 2024, known as the Jack Rabbit III trials (JRIII). The aim of the project is to address gaps in modeling methodologies and emergency response procedures. To support the project, an international model inter-comparison exercise using data from the Desert Tortoise and FLADIS trials was

initiated in 2021 to evaluate the performance of atmospheric dispersion models against data from previous large-scale ammonia experiments.

The objective of the collaborative modeling exercise is to understand the capabilities and limitations of models that could be used to design the new JRIII trials (e.g., suitable sensor placement). Dispersion modeling teams from around the world have been invited to participate on a voluntary basis. The exercise follows a similar successful model inter-comparison exercise conducted in 2019-20 on the Jack Rabbit II chlorine dispersion dataset. The coordinators of the JRIII inter-comparison exercise provided a set of model inputs for the participants to use and requested model predictions to be provided to them in a standardized format. Twenty-five independent modeling teams from Europe and North America are currently participating, using a range of different models (i.e., workbook approaches, integral models, Gaussian puff, and computational fluid dynamics models). This presentation summarizes the exercise's findings, including results from statistical comparisons and sensitivity tests.

Motivation*

The worldwide use of ammonia as an agricultural fertilizer, chemical feedstock and refrigerant has been growing in recent years and is forecast to increase significantly in the coming decades with the use of green ammonia as a renewable energy vector. It is important to ensure the safety and security of this ammonia infrastructure, which requires an understanding of the potential consequences of ammonia releases. Atmospheric dispersion models are critical to that effort. It is important to ensure the quality and robustness of these models which may be used for regulatory risk assessments, emergency response, and incident investigation.

NOTE**: In addition to the short abstract, you should provide a **short motivation** indicating what is the possible contribution of your work to the underlying main theme of the conference: ***Harmonisation within modelling, in a broad sense.
A dictionary definition of harmonisation is "to cause things to be combined or to go together in a pleasing or effective way".

Such a motivation will help reviewers in their selection of papers for oral and poster presentations. In the context of the conference, presentations are especially welcomed if they deal with topics from the following list: establishing common frames of reference; increasing compatibility among methods; establishing consistency in methods; eliminating unnecessary differences in methodologies; and in general if they contribute towards common methodologies, e.g. in respect to models, associated tools, procedures and datasets.
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