PARTICLE PLUME DEPLETION ABOVE A HOMOGENEOUS RURAL COVER BY DRY DEPOSITION: IN SITU QUANTIFICATION BY GAS/PARTICLE DOUBLE TRACING METHOD

P. Roupsard1, E. Dupont2, O. Connan3, D. Hébert1, A. Faucheux2, Y. Lefranc2, B. Carissimo2, D. Maro1 and P. Laguionie1

1Institut de Radioprotection et de Sûreté Nucléaire (IRSN), ENV/STAA/RERTA, Cherbourg-en-Cotentin, F-50130, France
2CEREA (Atmospheric Environment Research and Teaching Center), EDF-R&D, École des Ponts, Ile de France, France

INTRODUCTION

- Atmospheric plume dispersion: models generally only consider diffusion and transport processes in the calculation of atmospheric concentrations, neglecting deposition phenomena. Particle plume depletion is not quantified for environmental and population impact studies.
- The only experimental work quantifying the depletion of an atmospheric particle plume is that of Doran and Horst (1985) at Hanford (USA), over semi-arid cover (desert grasses and sagebrush).
- To address the particle plume depletion above a homogeneous rural cover by dry deposition, an original method has been developed based on a dual gas/particle tracing.

METHOD

Illustration of the typical experimental apparatus

Caractérisation of micrometeorological conditions: ultrasonic anemometers and meteorological station

SUMMARY OF EXPERIMENTS

- 14 experiments realized between June 21th and July 2nd 2021
- Wet meteorological conditions for the season
  - Some experiments realized during rainy episodes
  - Others sites could be more indicate to study depletion under dry conditions
- Depletion quantified for unstable and neutral atmospheric conditions (A, B, C and D Pasquill stability class), principally for neutral (D) to slightly unstable (C) conditions

CONCLUSIONS AND PERSPECTIVES

- The method is relevant to study plume depletion, but wet atmospheric conditions were encountered during the campaign
- Material (gas samplers) must be made reliable to limit the loss of data

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