

# Sensitivity Analysis of Droplets Distribution to Test Conditions in Wind-tunnel Icing Experiments

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## Abstract

This paper investigates the role of uncertainties affecting the ice accretion phenomenon in ground experimental facilities. In particular, this work is focused on the uncertainties affecting the distribution of water over an airfoil, i.e the collection efficiency, within an ice wind tunnel. Following [1] and [2], the uncertainties over test conditions are first characterized. Afterwards, a Non-Intrusive Spectral Projection (NISP) library is used to propagate these uncertainties through a in-house particle tracking code coupled with the open-source Computational Fluid Dynamics (CFD) solver SU2. A sensitivity analysis highlights the dependency of the water distribution over the airfoil with respect of test conditions. The investigation of Sobol indexes allow to assess the relevance of every single source of uncertainty to the variance of the resulting collection efficiency.

## References

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