

On the difficulties to achieve closure between lab experiments, parameterization and field measurements of ice nuclei

C. Hoose, L. Hande, M. Hummel, M. Paukert

Karlsruhe Institute of Meteorology, Institute for Meteorology and Climate Research,
76131 Karlsruhe, Germany

Mineral dust has been identified as a main component of atmospheric ice nuclei by analyses of ice crystal residual particles and by model studies. Numerous laboratory studies have quantified the ice nucleation properties of dust from different sources reasonably well, and a number of parameterizations have been developed from these results. Yet, it remains to be shown that forward modeling of ice nuclei concentrations based on simulated or prescribed dust concentrations and lab-based parameterizations can lead to closure with field measurements of ice nuclei. We will present recent studies which explore the predicted concentrations of dust ice nuclei over Europe and in the Arctic, which tend to be underestimated compared to direct and indirect atmospheric observations. Furthermore, we will discuss whether primary biological particles can add significantly to ice nuclei numbers.