



Results from the FIN-2 formal comparison

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During the Fifth International Ice Nucleation Workshop (FIN-2) at the AIDA Ice Nucleation facility in Karlsruhe, Germany in March 2015, a formal comparison of ice nucleation measurement methods was conducted. During the experiments the samples of ice nucleating particles were not revealed to the instrument scientists, hence this was referred to as a “blind comparison”. The two samples used were later revealed to be Arizona Test Dust and an Argentina soil sample.

For these two samples seven mobile ice nucleating particle counters sampled directly from the AIDA chamber or from the aerosol preparation chamber at specified temperatures, whereas filter samples were taken for two offline deposition nucleation instruments. Wet suspension methods for determining IN concentrations were also used with 10 different methods employed. For the wet suspension methods experiments were conducted using INPs collected from the air inside the chambers (impinger sampling) and INPs taken from the bulk samples (vial sampling).

Direct comparisons of the ice nucleating particle concentrations are reported as well as derived ice nucleation active site densities. The study highlights the difficulties in performing such analyses, but generally indicates that there is reasonable agreement between the wet suspension techniques. It is noted that ice nucleation efficiency derived from the AIDA chamber (quantified using the ice active surface site density approach) is higher than that for the cold stage techniques. This is both true for the Argentina soil sample and, to a lesser extent, for the Arizona Test Dust sample too.

Other interesting effects were noted: for the ATD the impinger sampling demonstrated higher INP efficiency at higher temperatures (>255 K) than the vial sampling, but agreed at the lower temperatures (<255K), whereas the opposite was true for the Argentina soil sample.

The results are analysed to better understand the performance of the various techniques and to address any size-sorting effects and / or sampling line losses.