

Arctic field campaign to measure the ice-nucleating particle concentration with a high temporal and vertical resolution

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Aerosol-cloud interaction remains the biggest source of uncertainty in radiative forcing estimations. The radiative properties of clouds are dependent on its phase, i.e. whether clouds consist of ice crystals, liquid droplets or a mixture of both. Ice-nucleating particles (INPs) facilitate the nucleation of supercooled cloud droplets at temperatures above $-35\text{ }^{\circ}\text{C}$, thus promoting the transition from liquid cloud to mixed-phase clouds. In spring 2023 the INP concentration was measured at the Gruevbadet Atmosphere Laboratory (10 m asl) and Zeppelin Observatory (472 m asl) with the Portable Ice Nucleation Experiment (PINE) in Ny-Ålesund, Svalbard ($79\text{ }^{\circ}\text{N}$). These measurements aim to characterize the INP concentration variability and to investigate the origin and main transport paths into the Arctic. First results of both measurements are shown with an outlook for a future campaign utilizing unmanned aerial vehicles as well as remote sensing in collaboration with the Alfred Wegener Institute.

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