



Ice Nuclei measurements at Halley, Antarctica, during MAC

Amélie Kirchgaessner (1), Michael Flynn (2), and Tom Lachlan-Cope (1)

(1) British Antarctic Survey, Atmosphere, Ice and Climate Team, Cambridge, United Kingdom (acrki@bas.ac.uk), (2) School of Earth, Atmospheric and Environmental Sciences, University of Manchester, Manchester, M13 9PL, United Kingdom

We will present an initial analysis of ground based INP measurements carried out in coastal Antarctica, and put them into context with aircraft measurements of cloud and aerosol particles carried out simultaneously in the area. Climate and weather forecasting models perform significantly poorer in southern hemisphere high latitudes than at mid-latitudes, not least due to a lack of in situ measurements of parameters relevant to the radiation and thus surface mass balance in Antarctica. As part of the project MAC (Microphysics of Antarctic Clouds) in November and December 2015 a Spectral ice Nuclei Counter (SPIN, DMT Inc) was deployed at Halley in the Clean Air Sector Laboratory (CASLab). The instrument has a particle detection range from 0.5 – 15 μm . The detector design allows for sizing of individual particles, and discrimination between ice and water particles.

Two types of measurements were performed. Firstly, a sequence of predefined temperature and super saturation settings was run daily sampling ambient air. Secondly, air, collected during flight missions with the British Antarctic Survey's MASIN aircraft in bags, was led through the instrument, also at predefined temperature and super saturation settings. These bag samples were usually taken over open water and over sea ice. These bag samples were also analysed with an SMPS (Scanning Mobility Particle Sizer) and a CPC (Condensation Particle Counter). The aircraft was equipped with a comprehensive suite of meteorological instruments, complemented by a 2D-S (2D-stereo particle imaging probe), a CAPS (Cloud and Aerosol Particle Spectrometer), and a CPC.

Apart from initial results on INP numbers and concentrations in coastal Antarctica, this presentation will also deal with “lessons learnt” regarding how (not) to carry out measurements and set up future experiments in similar conditions.