



Characterizing Arctic aerosol in the high and low Arctic during NETCARE 2015

Julia Burkart (1,2), Megan Willis (2), Heiko Bozem (3), Daniel Kunkel (3), Peter Hoor (3), Hannes Schulz (4), Andreas Herber (4), Sarah Hannah (5), Richard Leitch (6), and Jon Abbatt (2)

(1) Institute of Materials Chemistry, Vienna University of Technology, Austria, (2) Department of Chemistry, University of Toronto, Canada, (3) Institute of Atmospheric Physics, Johannes Gutenberg University Mainz, Germany, (4) Alfred Wegener Institute for Polar and Marine Research, Bremerhaven, Germany, (5) Department of Chemistry, University of British Columbia, Canada, (6) Environment and Climate Change Canada, Toronto, Canada

The Arctic aerosol is well known to show distinct seasonal variations with a maximum in aerosol mass concentrations during late winter and early spring referred to as Arctic haze. To characterize the Arctic haze phenomenon and related processes extensive aerosol measurements (particle number and size, aerosol composition and black carbon, and trace gases) were conducted from the Polar 6 aircraft (Alfred Wegener Institute, Germany) in April 2015. The campaign covered locations in the high Arctic (Alert and Eureka) and low Arctic (Inuvik). Flights focused on vertical profiles from 60m agl up to 6 km. We present the vertical distribution of aerosol number concentrations in different size ranges (5nm to 1 μ m), black carbon mass concentrations and CO mixing ratios at these three locations. Differences between the high and low Arctic will be highlighted and discussed together with 10 days FLEXPART back trajectories. Air masses in the low Arctic were dominated by a distinct pollution layer tracing back to sources in Northern China, while air masses observed in the high Arctic were less polluted and exhibited a longer residence time (up to 10 days) within the Arctic. We show that there is evidence for black carbon deposition in the high Arctic boundary layer. A decrease in black carbon mass concentrations was frequently observed within the lowest 1000m of the high Arctic atmosphere.