Source Influences on the Aerosol Size Distribution and Cloud Condensation Nucleus (CCN) Activity at the Resolute Bay Ground Site in Canada

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Aerosol measurements at the Canadian Aerosol Baseline Measurement station at Resolute Bay began in May 2013 with the main objective of estimating the influence of shipping emissions on the physical and optical properties of the measured aerosol. The on-going measurements are particle light absorption, particle light scattering, particle size distribution, sulfur dioxide (SO_2), ozone (O_3), mono nitrogen oxides (NO_x) and fine particles ($PM_{2.5}$). During the July, 2014 NETCARE POLAR 6 campaign, measurements of cloud condensation nucleus (CCN) number concentrations were also made at the site. Here the focus is on the observations of small particles (10-100 nm), their CCN activity and observed growth that may enhance their CCN activity at supersaturations between 0.4% and 1%. The observations will be considered for different potential sources: ship plumes, local sources (e.g. garbage burns), regional biogenic sources and long-range transported aerosols (including wild fires).

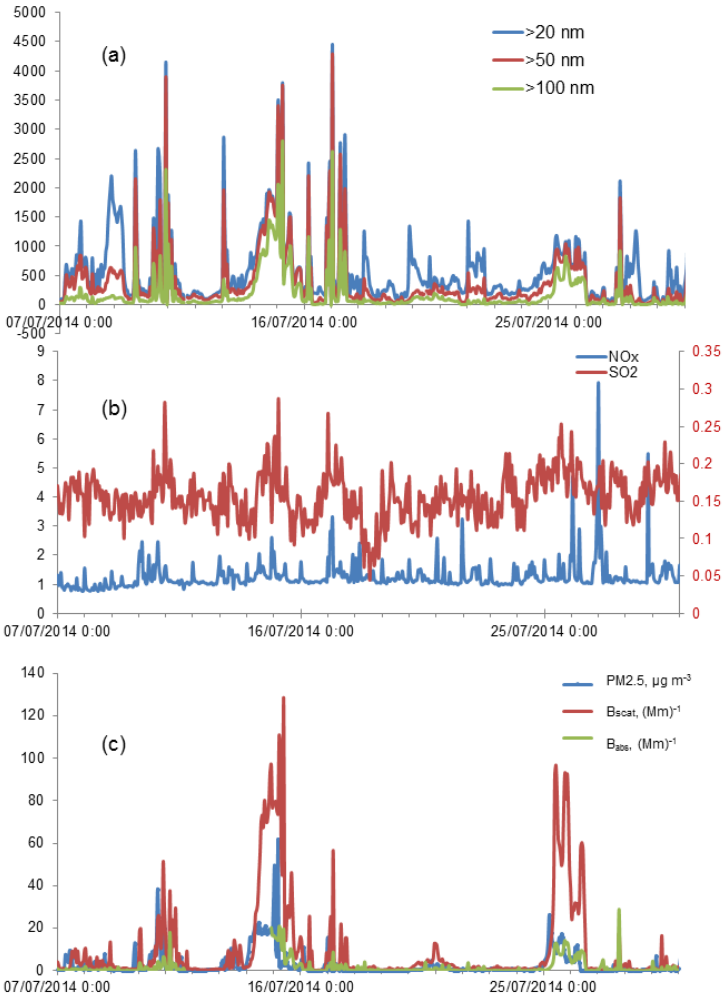

Figure 1. Particle number concentrations (cm^{-3}) in >20, 50 and 100 nm sizes show new particle formation and wild-fire event influences with episodic increases on particle formation. b) shows NO_x and SO_2 levels for anthropogenic influences and c) shows light absorption and scattering measurements (550 nm) and $PM_{2.5}$ mass at Resolute Bay (74.6°N, 94.9°W), Nunavut, Canada.