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Properties of aerosols and their wet deposition in the arctic spring during ASTAR2004 at Ny-Alesund, Svalbard

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Abstract. During the period of scientific campaign "Arctic Study of Tropospheric Aerosols, Clouds and Radiation 2004" (ASTAR2004), precipitation samples were collected in late spring at Ny-Alesund, Svalbard and their ionic components were analyzed in parallel with the measurement of properties of atmospheric aerosol particles at the same place. Backward trajectory analyses indicated that the air mass above the observatory initially dominated by air masses from the Arctic Ocean, then those from western Siberia and later those from Greenland and the Arctic Ocean. In the measurement period, six precipitation samples were obtained and five of them were analyzed their ionic components by ionchromatography. The concentrations of nss-sulphate in precipitations were between 1.8 and 24.6 ppm from which the scavenging ratio and scavenging coefficients were calculated using the data such as the concentrations of nss-sulphate in aerosol particles, amounts of precipitations, and the heights of precipitations obtained from radar echo data. The scavenging ratio ranged from 1.0×10^6 to 17×10^6 which are comparable values reported in other areas. A detailed comparison between precipitation events and the number concentration of aerosol particles obtained from optical particle counters suggests that the type of precipitations, i.e. rain or snow, significantly affects the number concentrations of aerosol particles.

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