PHYSICAL AND CHEMICAL CHARACTERISATION OF ALPINE AEROSOLS AT THE GAW OBSERVATORY SCHNEEFERNERHAUS ON MOUNT ZUGSPITZE

A. Zerrath, K. Krause, T. Franze, C. Schauer, A. Messerer, S. Kamm, R. Niessner, and U. Pöschl

Technical University of Munich, Institute of Hydrochemistry, Marchioninistr. 17, D-81377 Munich, Germany (ulrich.poeschl@ch.tum.de)

The physical and chemical characterisation of alpine aerosols is one of the central objectives of the research project SCAVEX (Schneefernerhaus Aerosol and Reactive Nitrogen Experiment), which was started in 2001. The techniques applied during the first comprehensive aerosol measurement campaigns at the GAW observatory Schneefernerhaus on Mount Zugspitze and first results (particle number and mass concentration, size distribution, chemical composition) are presented.

Depending on the meteorological situation, the observed total particle number concentrations varied typically from a few hundred up to a few thousand particles per cubic centimetre. At low particle concentrations, i.e. under clean conditions such as free tropospheric air, the number size distributions exhibited a maximum in the accumulation mode (particle diameter ca. 100 nm). At high particle concentrations different size distribution patterns were observed, on some occasions a strong nucleation mode (particle diameter ca. 20 nm) dominated the total number concentration, on others also the accumulation mode was enhanced. The PM2.5 mass concentration varied between 0.5 and 10 μg/m^3 (NTP, 3-10 day averages).