

Name of research institute or organization:

Laboratory of Atmospheric Chemistry, Paul Scherrer Institute

Title of project:

Alpine nucleation in summertime (ANiS)

Part of this programme:

Horizon 2020 MSCA-IF project Nano-CAVa

Project leader and team:

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Project description:

Measurement of atmospheric aerosol particles smaller than 3 nm in diameter have become possible only recently due to development in measurement technologies. Therefore data about their behaviour in different parts of the atmosphere have been lacking. During this project we will fill this gap considering high-alpine environment in summertime by conducting measurements with the Particle Size Magnifier at Jungfraujoch in June-August 2016. The concentration of sub-3 nm particles is connected to the dynamics of ion clusters, as well as possible new particle formation.

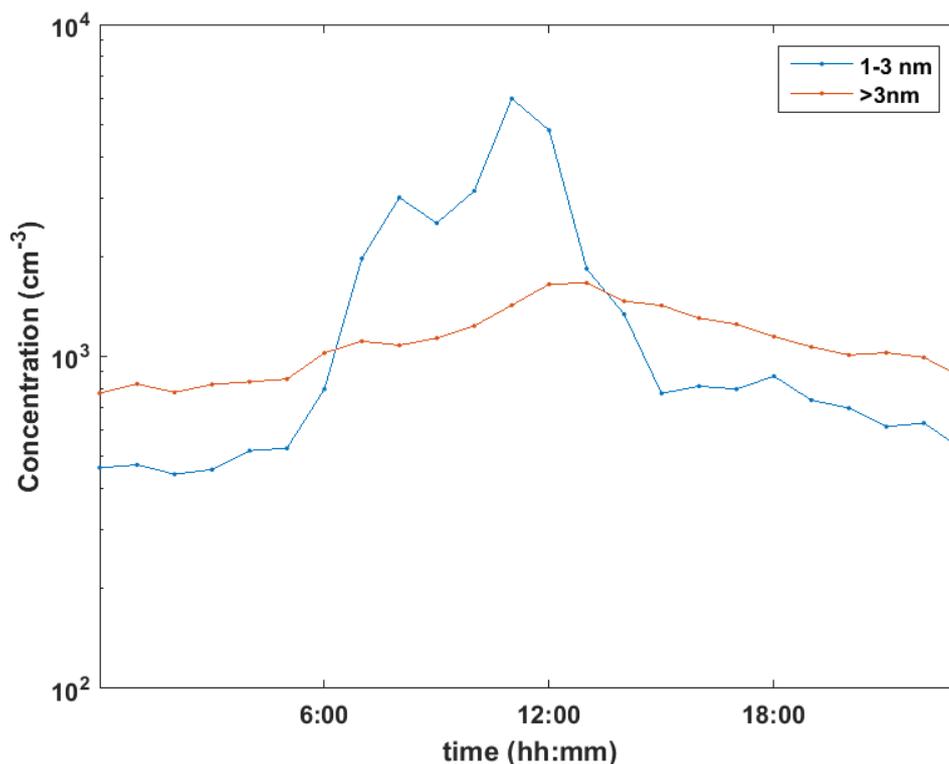


Figure 1. The diurnal variation of the concentration of 1-3 nm sized particles (blue) and particles larger than 3 nm (red) at Jungfraujoch during summer 2016.

We found out that sub-3 nm particles exist continuously in alpine atmosphere, which can be clearly seen from Figure 1. The concentrations were low during the nighttime and show a maximum around noon, which is pointing towards photochemical production of clusters and/or small particles. The diurnal variation of 1-3 nm particles was observed to be stronger

than the variation in the population of larger particles, which acts as a sink for the newly formed particles and clusters. This is consistent with observations from other clean background sites. The project will be continued by comparing the concentration to different environmental and meteorological variables as well as the ion concentrations measured with the NAIS. This will give an indication about their formation pathways and the importance of ions at this location.

Key words:

Aerosols, nucleation

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