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Challenges of an aerosol closure at an Arctic site

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Aerosol closure studies shall compare aerosol microphysical and optical parameters derived simultaneously via in-situ and remote sensing instruments. Hence, a successful closure explains the radiative forcing of the aerosol, which is unfortunately still only roughly constrained in our climate system.
Due to our incomplete knowledge on the scattering of arbitrarily shaped particles, such a closure must not be given. However, using depolarization of lidar data it can be estimated whether Mie theory may be assumed as an approximation.
Ny-Ålesund is one of the best equipped research sites in the Arctic. It is located at 78.9° N and 11.9° E on Spitsbergen. In this contribution one successful and one unsuccessful example of a closure is presented. In the Arctic probably a low boundary layer and local micrometeorological phenomena at low wind speeds further complicate the comparability of different aerosol measurements.

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