

A multispectral complete Stokes polarimeter and polarized radiance measurements in the Arctic

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Abstract

Aerosol scattering changes the state of sun light in terms of spectral intensity and polarization. Thus, polarization can be used to retrieve aerosol properties such as optical properties (AOT, refractive index,...), particle number concentration and other aerosol related parameters. The knowledge of aerosol parameters helps to examine and understand the effects of aerosols on the climate. One way to describe polarization of light is the Stokes vector. The multispectral polarimeter AMSSP (airborne multispectral sunphotometer and polarimeter) measures four intensities with different sets of polarizing components simultaneously. Those intensities and a proper characterization of the

components of the instrument are needed to calculate the complete Stokes vector. All angles and further parameters of the polarization sensitive optical components were determined during laboratory calibrations. The characterization of the instrument is crucial as small changes in the instrumental parameters result in incorrect Stokes parameters. First preliminary results of the measurements of AMSSP during an Arctic cruise with the Polarstern 2017 will be presented as well.