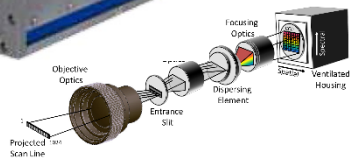
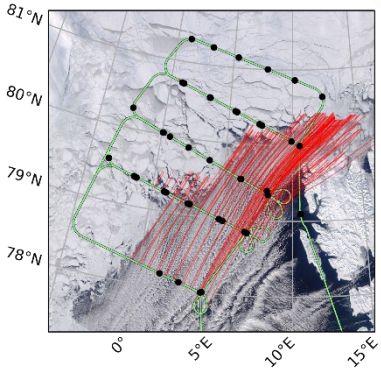
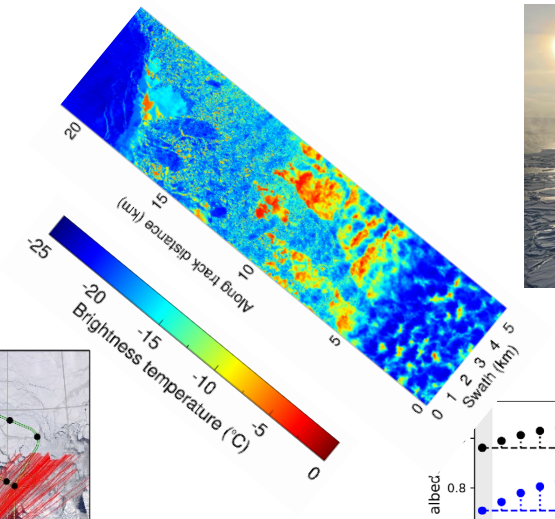
Topic for Master Thesis
Seminar topic: Research & Methods

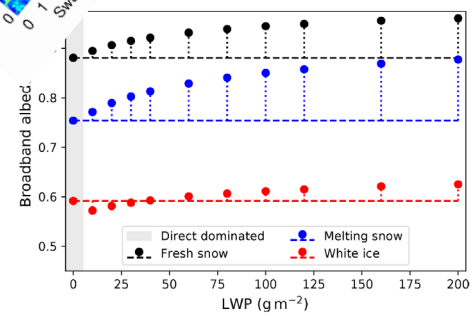
Group Atmospheric Radiation

Can we detect thin clouds over sea ice?









Master Thesis:
- analysis of airborne measurements of Arctic boundary layer clouds observed during HALO-(AC)³, ACLOUD and AFLUX
- comparison of solar and thermal infrared cloud detection
- sensitivity study preparing for a retrieval of thin clouds over sea ice
- application of the retrieval to test cases

Sem. Research:
- evolution of Arctic stratocumulus in cold air outbreaks
- impact of atmospheric environment on cloud formation
- impact of sea ice inhomogeneities on cloud formation
- change of surface albedo with increasing cloud thickness

Sem. Methods:
- remote sensing of clouds (spectral solar and thermal infrared)
- sensitivity of cloud retrieval to surface albedo (sea ice/open ocean)

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Anmeldung eines Themas für ein/e

Forschungsseminar	**x**	
Methodenseminar	**x**	
Masterarbeit	**x**	(bitte eines oder mehrere ankreuzen)

Thema Datum	Can we detect thin clouds over sea ice from passive remote sensing? available from 16. August 2023
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Zweitgutachter	Prof. Dr. Andreas Macke, TROPOS
Kurzbeschreibung:	**Master Thesis:** - analysis of airborne measurements of Arctic boundary layer clouds observed during HALO-(AC)³, ACLOUD and AFLUX - comparison of solar and thermal infrared cloud detection - sensitivity study preparing for a retrieval of thin clouds over sea ice - application of the retrieval to test cases **Sem. Research:** - evolution of Arctic stratocumulus in cold air outbreaks - impact of atmospheric environment on cloud formation - impact of sea ice inhomogeneities on cloud formation - change of surface albedo with increasing cloud thickness **Sem. Methods:** - remote sensing of clouds (spectral solar and thermal infrared) - sensitivity of cloud retrieval to surface albedo (sea ice, fresh old)
Literatur:	Gryschka, M., C. Drüe, D. Etling, and S. Raasch (2008), On the influence of sea-ice inhomogeneities onto roll convection in cold-air outbreaks, Geophys. Res. Lett., 35, L23804, doi:10.1029/2008GL035845. Warren, S. G. (1982). Optical properties of snow. Reviews of Geophysics, 20(1), 67. doi:10.1029/rg020i001p00067 Ehrlich, A., Schäfer, M., Ruiz-Donoso, E., and Wendisch, M., Airborne Remote Sensing of Arctic Clouds, In: Kokhanovsky A. (eds) Springer Series in Light Scattering, Volume 5, 39-66, doi:10.1007/978-3-030-38696-2_2, 2020.