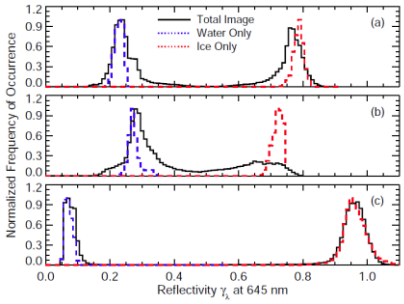
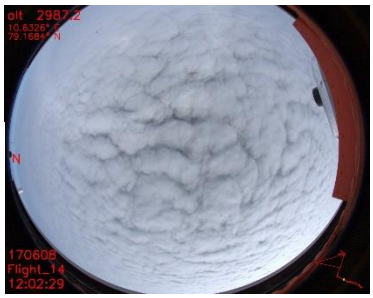
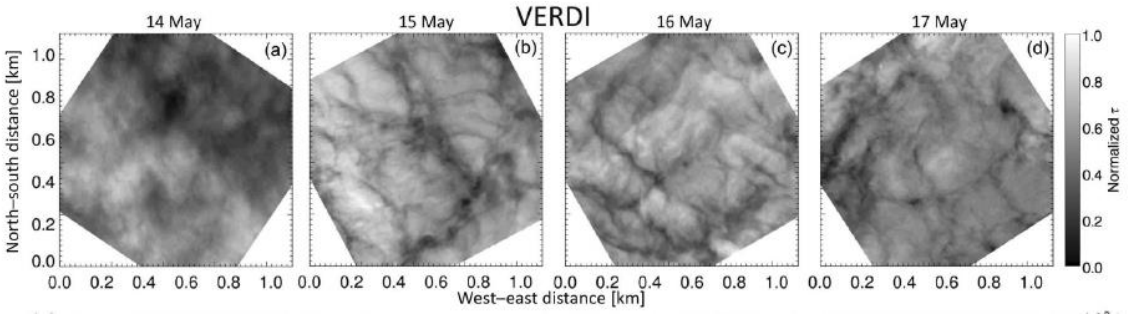
Topic for Master Thesis
Seminar topic: Research & Methods

Group Atmospheric Radiation

Remote sensing of Arctic clouds by imaging cameras







Master Thesis:
- analysis of camera measurements of Arctic boundary layer clouds observed during ACLOUD and AFLUX
- comparison of a push-broom line-camera and a 2D-camera
- quantify cloud inhomogeneities from both viewing geometries
- identification and quantification of 3D radiative effects

Sem. Research:
- structures of Arctic stratocumulus (roll convection, cell convection)
- impact of surface fluxes and cloud top processes on cloud inhomogeneities
  - cold air outbreaks
  - warm air intrusions
- impact of cloud inhomogeneities on 3D radiative processes

Sem. Methods:
- general types of imaging devices: scanner, line scanner, 2D image
- remote sensing of clouds (plan parallel assumption vs. 3D)
- parameters to quantify the cloud inhomogeneity

Contact: Dr. André Ehrlich, LIM, Zi. 9, 0341-97 32874, a.ehrlich@uni-leipzig.de

Anmeldung eines Themas für ein/e

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

Thema Datum	Remote sensing of Arctic clouds with imaging cameras available from 24. Juni 2020
Betreuer (mit Kontaktdaten)	Univ.-Prof. Dr. Manfred Wendisch Leipzig Institute for Meteorology (LIM) Stephanstr. 3, D-04103 Leipzig, Germany ++49 (0) 341 97 32 851 (Phone)
ggf. weitere Kontaktperson	André Ehrlich, Phone: +49 341 97-32874 Email: a.ehrlich@uni-leipzig.de
Zweitgutachter	Prof. Dr. Andreas Macke, TROPOS
Kurzbeschreibung:	**Master Thesis:** - analysis of camera measurements of Arctic boundary layer clouds observed during ACLOUD and AFLUX - comparison of a push-broom line-camera and a 2D-camera - quantify cloud inhomogeneities from both viewing geometries - identification and quantification of 3D radiative effects **Sem. Research:** - structures of Arctic stratocumulus (roll convection, cell convection) - impact of surface fluxes and cloud top processes on cloud inhomogeneities - cold air outbreaks - warm air intrusions - impact of cloud inhomogeneities on 3D radiative processes **Sem. Methods:** - general types of imaging devices: scanner, line scanner, 2D image - remote sensing of clouds (plan parallel assumption vs. 3D) - parameters to quantify the cloud inhomogeneity
Literatur:	Schäfer, M., Bierwirth, E., Ehrlich, A., Jäkel, E., Werner, F., and Wendisch, M. ,Directional, horizontal inhomogeneities of cloud optical thickness fields retrieved from ground-based and airborne spectral imaging, Atmos. Chem. Phys., 17, 2359-2372, doi:10.5194/acp-17-2359-2017, 2017. Schäfer, M., Loewe, K., Ehrlich, A., Hoose, C., and Wendisch, M., Simulated and observed horizontal inhomogeneities of optical thickness of Arctic stratus, Atmos. Chem. Phys., 18, 13115-13133, doi:10.5194/acp-18-13115-2018, 2018. 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.