

Anmeldung eines Themas für ein/e

Forschungsseminar
Methodenseminar
Masterarbeit (bitte eines oder mehrere ankreuzen)

Topic Date 2.7.24	Characterization of the planetary boundary layer above the Arctic sea ice by using the water vapor profiles from lidar measurements
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Brief description:	During the MOSAiC campaign, profiles of the water vapor mixing ratio north of 85°N were measured continuously with a lidar from October 2019 to February 2020. This water vapor information will be used together with results from radiosonde measurements to examine the structure of the Arctic planetary boundary layer and the coupling or decoupling of air masses to the sea ice and to investigate the water vapor budget of the Arctic boundary layer above the sea ice. The master's thesis bases on the master's thesis completed in 2023 (Seidel, 2022) with a focus on the evaluation of the water vapor measurements.
Literature:	<p>Andreas et al.: Near-surface water vapor over polar sea ice is always near ice saturation, <i>J. Geophys. Res.</i>, 107(C10), https://doi.org/10.1029/2000JC000411 (2002)</p> <p>Law et al.: Arctic Air Pollution, New Insights from POLARCAT-IPY, <i>Bulletin of the American Meteorological Society</i> 95, 12; 10.1175/BAMS-D-13-00017.1, https://doi.org/10.1175/BAMS-D-13-00017.1 (2014)</p> <p>Persson and Vihma: The atmosphere over sea ice, Chapter 6 in <i>Sea Ice</i>, Third Edition, edited by David N. Thomas, John Wiley & Sons, Ltd, Chichester, UK, https://doi.org/10.1002/9781118778371.ch6 (2017)</p> <p>Naakka et al.: Arctic Humidity Inversions: Climatology and Processes, <i>Journal of Climate</i>, 31(10), 3765–3787, https://doi.org/10.1175/JCLI-D-17-0497.1 (2018)</p> <p>Griesche et al.: Contrasting ice formation in Arctic clouds: surface-coupled vs. surface-decoupled clouds, <i>Atmos. Chem. Phys.</i>, 21, 10357–10374, https://doi.org/10.5194/acp-21-10357-2021 (2021)</p> <p>Seidel: Analysis of water vapour mixing ratio profiles in the Arctic from Raman lidar measurements during the MOSAiC-campaign, Masterarbeit, University of Leipzig, https://nbn-resolving.org/urn:nbn:de:bsz:15-qucosa2-845481 (2022)</p> <p>Akansu et al.: Evaluation of methods to determine the surface mixing layer height of the atmospheric boundary layer in the central Arctic during polar night and transition to polar day in cloudless and cloudy conditions, <i>Atmos. Chem. Phys.</i>, 23, 15473–15489, https://doi.org/10.5194/acp-23-15473-2023 (2023)</p> <p>Xi et al.: Evaluation of the planetary boundary layer height from ERA5 reanalysis with MOSAiC observations over the Arctic Ocean, <i>Journal of Geophysical Research: Atmospheres</i>, 129, e2024JD040779, https://doi.org/10.1029/2024JD040779 (2024)</p>