Anmeldung eines Themas für ein/e

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

Thema Datum	Assessing humidity growth effects of different aerosol types using ground-based Raman lidar observations. 16. September 2024
Erstgutachter	Prof. Dr. Andreas Macke
Kontaktpersonen (mit Kontaktdaten)	Dr. Julian Hofer, hofer@tropos.de Dr. Holger Baars, baars@tropos.de
Zweitgutachter	To be determined
Kurzbeschreibung:	Hygroscopic growth and shrinkage processes change the size, refractive index, and partly also the shape of aerosol particles and thus also their optical, radiative and nucleating properties (e.g., Haarig et al., 2017). PollyXT Raman lidars (Engelmann et al., 2016) have the capability to measure water vapor mixing ratio (e.g., Dai et al., 2018). Simultaneous profiling of water vapor mixing ratio and particle optical properties allow to study aerosol hygroscopicity (e.g., Althausen et al., 2020; Navas-Guzmán et al., 2019). For calibration and calculation of relative humidity, the use of radiosonde, model, and microwave radiometer data can be intercompared. Data from PollyNET (Baars et al., 2016), a network of PollyXT lidars, from contrasting stations with different aerosol and humidity conditions like Germany, Cabo Verde, Cyprus, and Tajikistan shall be used.
Literatur:	-Althausen et al.: Investigations to hygroscopic aerosol growth within the convective boundary layer, EPJ Web Conf. 237, Proc. ILRC 29, https://doi.org/10.1051/epjconf/202023702016, 2020 -Baars, H. et al.: An overview of the first decade of PollyNET: an emerging network of automated Raman-polarization lidars for continuous aerosol profiling, Atmos. Chem. Phys., 16, 5111–5137, https://doi.org/10.5194/acp-16-5111-2016, 2016. -Dai, G. et al.: Calibration of Raman lidar water vapor profiles by means of AERONET photometer observations and GDAS meteorological data, Atmos. Meas. Tech., 11, 2735–2748, https://doi.org/10.5194/amt-11-2735-2018, 2018. -Engelmann, R. et al.: The automated multiwavelength Raman polarization and water-vapor lidar PollyXT: the neXT generation, Atmos. Meas. Tech., 9, 1767–1784, https://doi.org/10.5194/amt-9-1767-2016, 2016. -Haarig, M. et al.: RH dependence of depolarization ratio, backscatter, and extinction from multiwavelength lidar measurements during SALTRACE, Atmos. Chem. Phys., 17, 14199–14217, https://doi.org/10.5194/acp-17-14199-2017, 2017. Navas-Guzmán, F.: Characterization of aerosol hygroscopicity using Raman lidar measurements at the EARLINET station of Payerne, Atmos. Chem. Phys., 19, 11651–11668, https://doi.org/10.5194/acp-19-11651-2019, 2019.