

Announcement of a topic for:

Seminar Research **X**
Seminar Methods **X**
Master Theses **X** (please mark one or more)

Topic	Spatiotemporal evolution of Cloud Top Height (CTH) for selected ACTRIS stations
Release Date	02.09.2024
Supervisor (contact)	Prof. Dr. Andreas Macke Permoser Str. 15, 04318 Leipzig andreas.macke@tropos.de 0341-2717-7060
Additional Contact	Dr. Athena A. Floutsi floutsi@tropos.de Dr. Moritz Haarig haarig@tropos.de
Second Reviewer	Dr. Matthias Tesche matthias.tesche@uni-leipzig.de
Description:	<p>Clouds contribute significantly to the Earth's radiative budget and our limited knowledge on their interactions with other atmospheric components induce large uncertainties to radiative transfer calculations and in general circulation models. With respect to that, Cloud Top Height (CTH) is a key-parameter that provides valuable information on the vertical distribution of liquid water, cloud thermodynamic phase, cloud classification, etc.</p> <p>In this thesis, the student will use the CTH product from the recently-launched EarthCARE satellite. The CTH product will be examined for overpasses co-located with ACTRIS ground-based stations (e.g., in Mindelo, Cabo Verde, in Leipzig, Germany, in Limassol, Cyprus etc.) and a study over the spatiotemporal evolution of the CTH over that specific station will be performed. EarthCARE's CTH will also be validated with radar-derived CTH from Cloudnet.</p>
Literature:	<p>Wandinger, U., Haarig, M., Baars, H., Donovan, D., and van Zadelhoff, G.-J.: Cloud top heights and aerosol layer properties from EarthCARE lidar observations: the A-CTH and A-ALD products, <i>Atmos. Meas. Tech.</i>, 16, 4031–4052, https://doi.org/10.5194/amt-16-4031-2023, 2023.</p> <p>Holz, R. E., S. A. Ackerman, F. W. Nagle, R. Frey, S. Dutcher, R. E. Kuehn, M. A. Vaughan, and B. Baum (2008), Global Moderate Resolution Imaging Spectroradiometer (MODIS) cloud detection and height evaluation using CALIOP, <i>J. Geophys. Res.</i>, 113, D00A19, doi:10.1029/2008JD009837.</p>