

Announcement of a topic for:

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

Topic	Evaluating AOT/AI as CCN proxy in light of height-resolved CCN climatologies from CALIPSO and CAMS
Release Date	15 July 2024
Supervisor (contact)	Matthias Tesche Institut für Meteorologie, Universität Leipzig Stephanstrasse 3, 04103 Leipzig Tel: 0341/97-36660 matthias.tesche@uni-leipzig.de
Additional Contact	Karoline Block, karoline.block@uni-leipzig.de
Second Reviewer	Johannes Quaas, j.quaas@rz.uni-leipzig.de
Description:	Satellite-based studies of aerosol-cloud interactions (ACI) commonly use columnar aerosol optical thickness (AOT) or aerosol index (AI) from passive remote sensing to approximate aerosol load (Quaas et al., 2020). Two recently developed climatologies of cloud condensation nuclei (CCN) concentrations from reanalysis (Block et al., 2024) and spaceborne lidar (Choudhury and Tesche, 2023) provide a much refined perspective of cloud-relevant aerosols for ACI studies. The aim of this work is to assess if and in how far AOT and AI can be found to correlate with height-resolved CCN concentrations, for instance averaged over the lowermost layers of the atmosphere.
Literature:	Block, K., Haghghatnasab, M., Partridge, D. G., Stier, P., and Quaas, J.: Cloud condensation nuclei concentrations derived from the CAMS reanalysis, <i>Earth Sys. Sci. Data</i> , 16, https://doi.org/10.5194/essd-16-443-2024 , 2024. Choudhury, G. and Tesche, M.: A first global height-resolved cloud condensation nuclei data set derived from spaceborne lidar measurements, <i>Earth Sys. Sci. Data</i> , 15, https://doi.org/10.5194/essd-15-3747-2023 , 2023. Quaas, J., Arola, A., Cairns, B., Christensen, M., Deneke, H., Ekman, A. M. L., Feingold, G., Fridlind, A., Gryspeerdt, E., Hasekamp, O., Li, Z., Lipponen, A., Ma, P.-L., Mülmenstädt, J., Nenes, A., Penner, J. E., Rosenfeld, D., Schrödner, R., Sinclair, K., Sourdeval, O., Stier, P., Tesche, M., van Dierenhoven, B., and Wendisch, M.: Constraining the Twomey effect from satellite observations: issues and perspectives, <i>Atmos. Chem. Phys.</i> , 20, https://doi.org/10.5194/acp-20-15079-2020 , 2020.