Announcement of a topic for:

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

Topic	Investigation of small-scale variations in cloud droplet number concentration from airborne lidar measurements
Release Date	15. July 2024
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Description:	Airborne observations with high spectral resolution lidar (Hair et al., 2008) and scanning polarimeter of shallow marine clouds in the Western North Atlantic Ocean east of the United States have been performed during the Aerosol Cloud meTeorology Interactions oVer the western ATlantic Experiement (ACTIVATE, Sorooshian et al., 2019; 2023) from 2020 to 2022. The ratio of the average extinction coefficient from cloud top down to about 2.5 optical depths into the cloud and the the scattering cross section calculated from the polarimeter size parameters gives an estimate of cloud droplet number concentration with very high spatial resolution of 1.25 m along the flight track. The aim of this work ist to analyse the thus resolved small-scale structures in cloud droplet number concentration to gain better insight into the variarion of this parameter in shallow marine cumulus clouds. .
Literature:	Hair, J. W., Hostetler, C. A., Cook, A. L., Harper, D. B., Ferrare, R. A., Mack, T. L., Welch, W., Isquierdo, L. R., and Hovis, F. E.: Airborne high spectral resolution lidar for profiling aerosol optical properties, Appl Opt., 47, https://doi.org/10.1364/ao.47.006734, 2008. Sorooshian et al.: Aerosol–Cloud–Meteorology Interaction Airborne Field Investigations: Using Lessons Learned from the U.S. West Coast in the Design of ACTIVATE off the U.S. East Coast, B. Am. Meteorol. Soc., 100, https://doi.org/10.1175/bams-d-18-0100.1, 2019. Sorooshian et al.: Spatially coordinated airborne data and complementary products for aerosol, gas, cloud, and meteorological studies: the NASA ACTIVATE dataset , Earth Syst. Sci. Data, 15, https://doi.org/10.5194/essd-15-3419-2023, 2023.