Contribution ID: **19** Type: **Talk**

Illuminating the Sub-Mesoscale Structure of Cold Pools with a Dense Station Network during FESSTVaL

Wednesday, 18 May 2022 10:00 (15 minutes)

Cold pools are crucial for understanding the organization of atmospheric convection. However, their detailed structure remains a blind spot of operational station networks. In summer 2021 the FESSTVaL field experiment aimed to address this observational gap and shed light on the structure and life cycle of cold pools on the sub-mesoscale (100 m to 10 km). The experiment took place in the rural surrounding of the Meteorological Observatory Lindenberg (south-east of Berlin, Germany) and featured a dense network of custom-designed low-cost measurement stations covering an area of 30-km diameter. The instrumental setup included 80 novel APOLLO stations sampling air temperature and pressure at 1-s resolution and 19 supplementary weather stations.

The FESSTVaL network recorded 43 cold pool events of different strength and size during the three-month measurement phase. Case studies demonstrate that the observations allow to capture the growth and internal temperature structure of a cold pool during its intensification phase. The spatio-temporal patterns of temperature and pressure perturbations suggests that a convective downdraft typically precedes the intensity maximum of the cold pool by about 10 to 20 minutes. Further measurements from radiosonde ascents and a X-band rain radar provide deeper insights into the cold pool dynamics and its controlling factors.

Primary authors: KIRSCH, Bastian (University of Hamburg); HOHENEGGER, Cathy (Max Planck Institute for Meteorology); KLOCKE, Daniel (Max Planck Institute for Meteorology); AMENT, Felix (University of Hamburg)

Presenter: KIRSCH, Bastian (University of Hamburg)

Session Classification: Deep convection and more