



Universität Hamburg
DER FORSCHUNG | DER LEHRE | DER BILDUNG

CENTRUM
FÜR ERDSYSTEMFORSCHUNG
UND NACHHALTIGKEIT (CEN)



FIELD EXPERIMENT ON SUB- MESOSCALE SPATIO-TEMPORAL VARIABILITY IN LINDENBERG

MAY 17 – AUGUST 27, 2021
WITH SOP: JUNE 5 - IN JULY 5

INITIATED BY HANS-ERTEL CENTER FOR WEATHER RESEARCH –
FUNDED BY DEUTSCHER WETTERDIENST



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What if FESSTVaL?

... **a campaign to study sub-mesoscale phenomena** (500 m – 5 km)

Goals of the field campaign:

- Improved understanding of sub-mesoscale processes and structures
- Validation of convection-permitting NWP models
- Tests of new instruments and measurement strategies for future observing networks

Research topics:

1. **Boundary layer structures**
2. **Cold pools**
3. **Wind gusts**

Plus a new approach:

4. **Citizen science**

Supplemented by:

5. **Modelling**

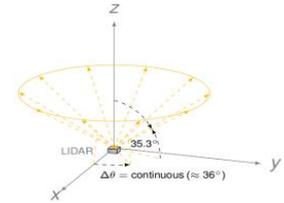
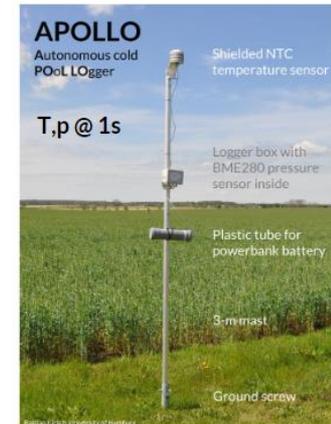


Figure IV: Quick continuous conical scan with permanently changing azimuth, and inclined beams ($t = 3.4$ s)

Measurement strategies (selection)

- ➔ Doppler-LiDARs in different scanning modes (9)
- ➔ Microwave Radiometer Network (4)
- ➔ Airborne ABL measurements with UAS (SOP)
- ➔ Tower and sfc measurements (turb, rad, ec, soil, basic,..)
- ➔ Dense network of autonomous measurement stations (ca. 100)
- ➔ X-band rain radar
- ➔ Radiosoundings
- ➔ Citizen Science network MESSI

Courtesy: J. Steinheuer (U. Cologne)

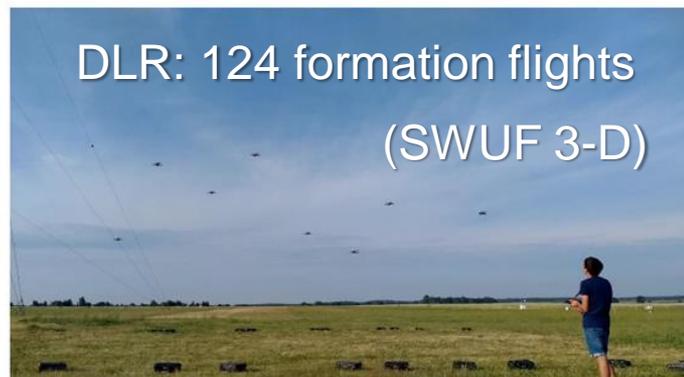


Courtesy: B. Kirsch (U. Hamburg)



Tübingen:
47 flights with MASC-3

Foto: B. Lammel

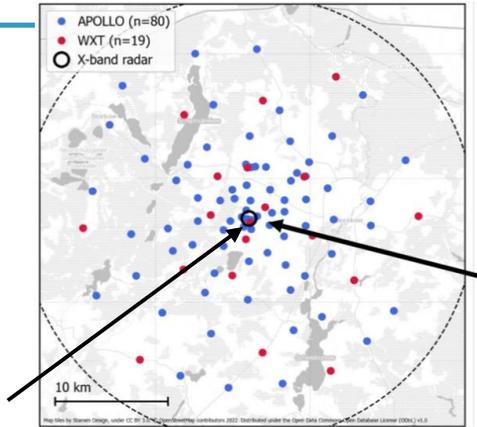


DLR: 124 formation flights
(SWUF 3-D)

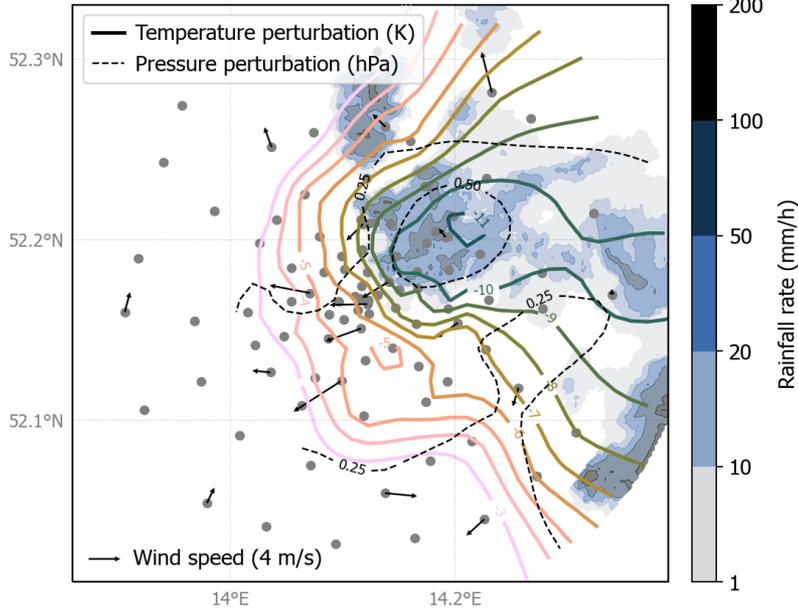
Foto: DLR

Cold Pool „Jogi“ Jun 29, 2021

APOLLO/WXT-Network + X-Band rain rate



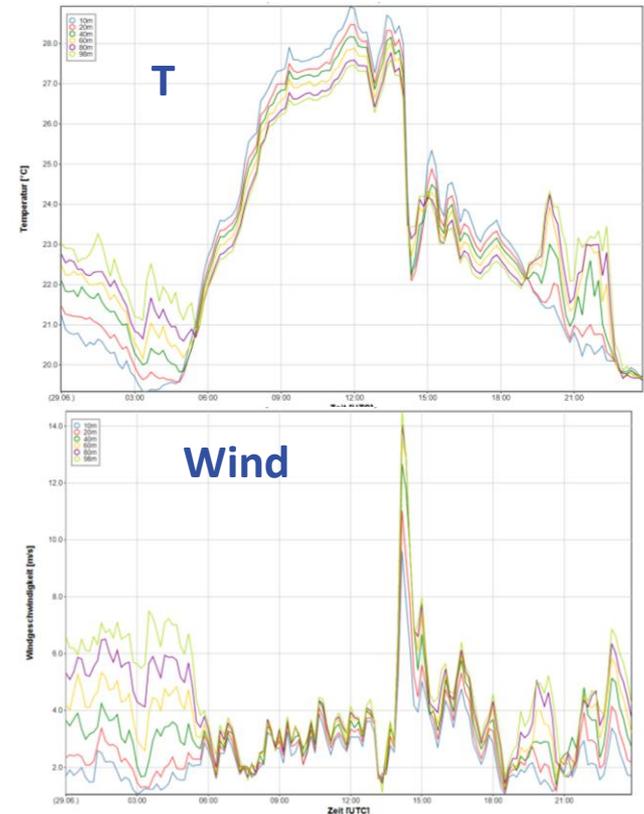
Cold Pool Event 29 Jun 2021, 14:15 UTC (Jogi)



Cortesy: B. Kirsch (Uni Hamburg)

Cortesy: F. Burgemeister (Uni Hamburg)

Tower data @ Falkenberg

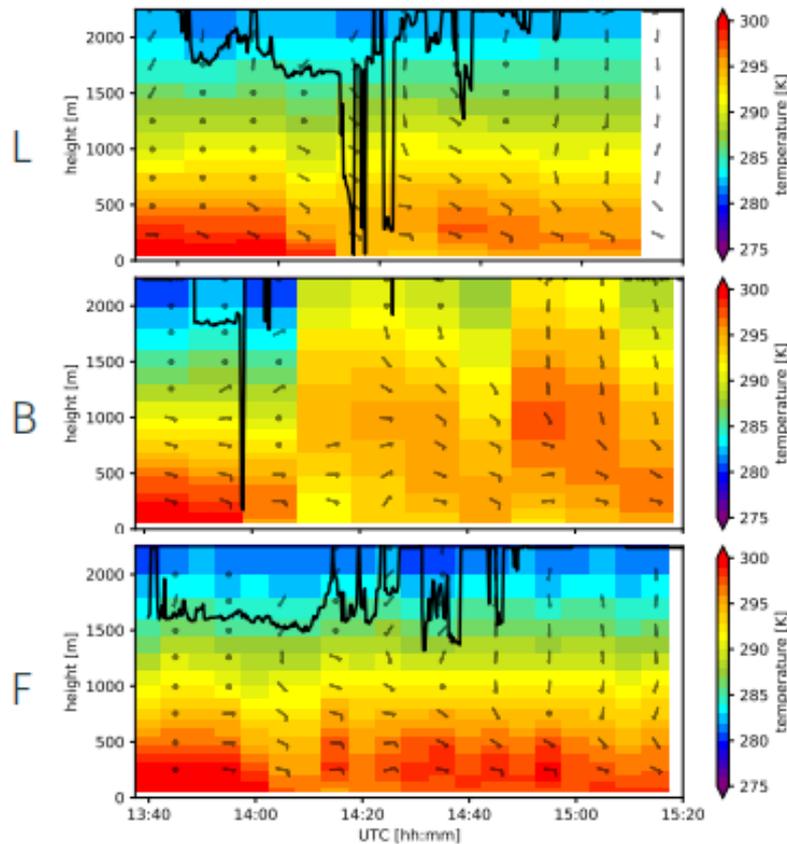


Cortesy: I. Lange (U. Hamburg)

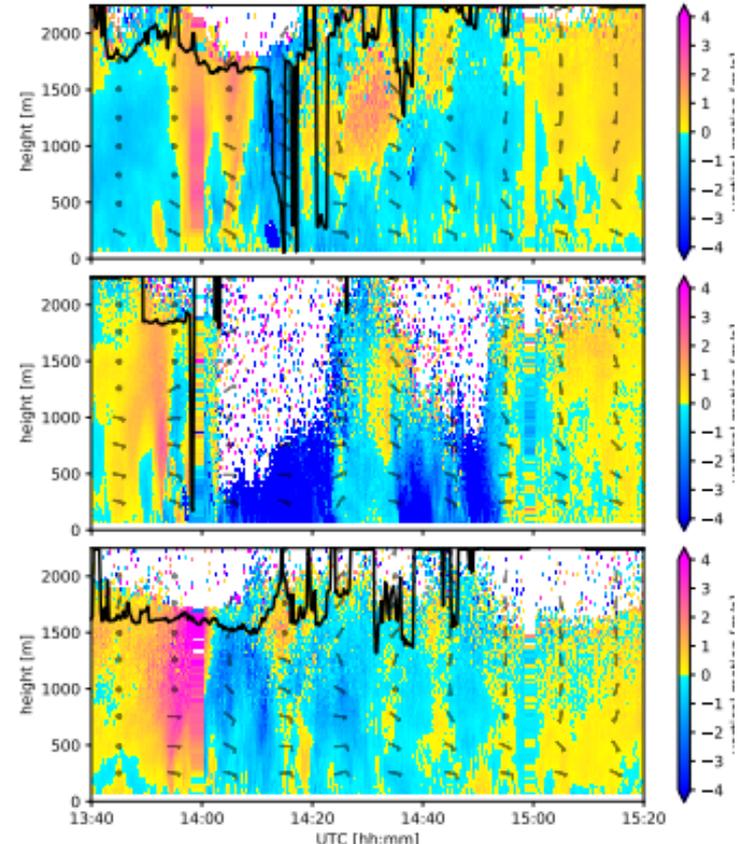


by C. Hohenegger from google

Cold Pool „Jogi“ – Jun 29, 2021 -Triangle measurement (13:40-15:20 h)



↑ MWRs

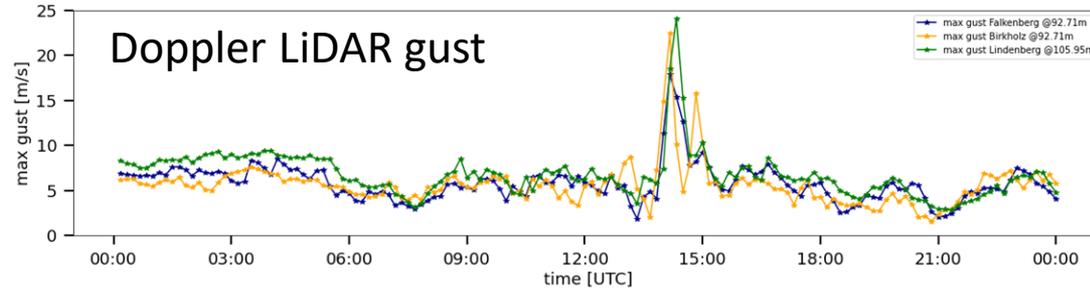
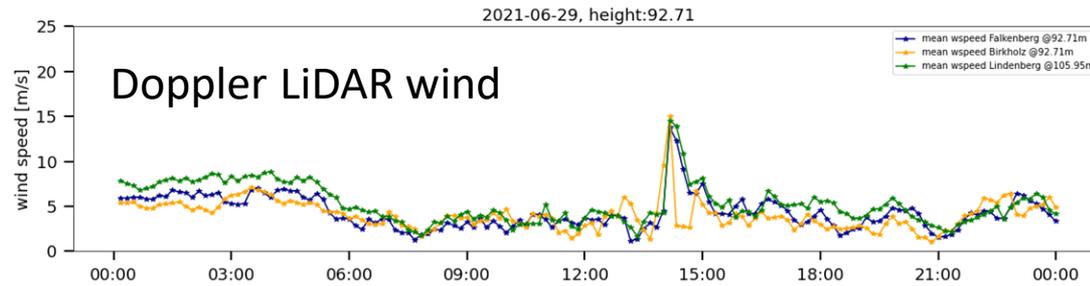
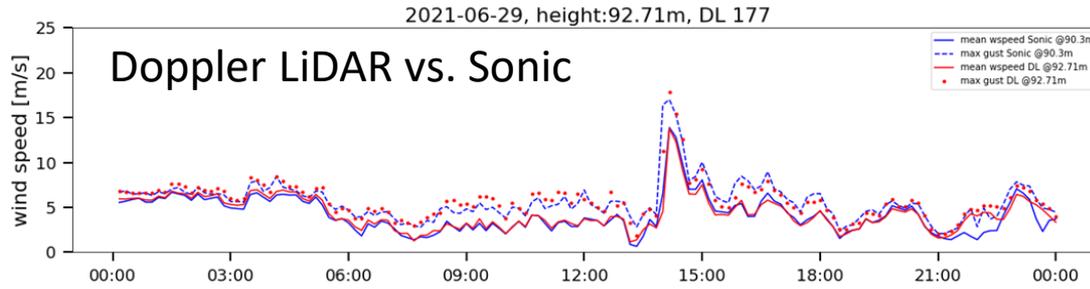


↑ DWLs w-component



by C. Hohenegger from google

Cold Pool „Jogi“ – Jun 29, 2021



Courtesy: C. Detring (DWD/MOL-RAO)

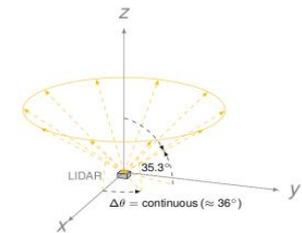
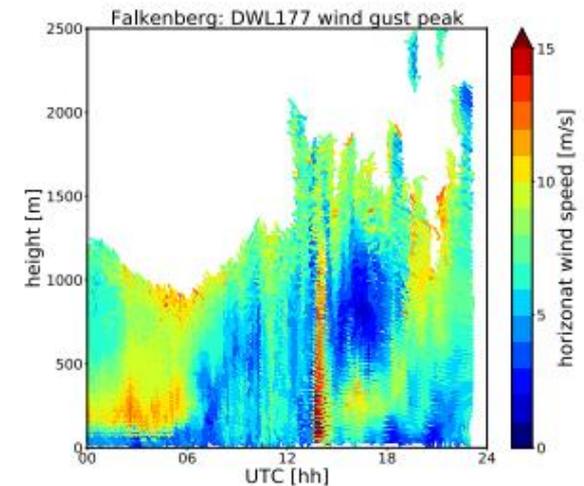


Figure IV: Quick continuous conical scan with permanently changing azimuth, and inclined beams ($t = 3.4$ s)

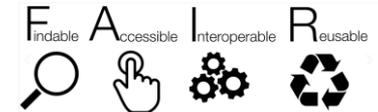


Courtesy: J. Steinheuer (U. Cologne)

Interested in the FESSTVaL-Data?

- **Archive for Standardized Atmospheric Measurement Data (SAMD)** at the Integrated Climate Data Center - ICDC

<https://www.cen.uni-hamburg.de/en/icdc/research/samd/observational-data/short-term-observations/festval.html>



- Standardized netCDF - format (CF convention) *Jahnke-Bornemann, Annika. (2022, February 8). The SAMD Product Standard (Standardized Atmospheric Measurement Data) (Version 2.0). <http://doi.org/10.25592/uhhfdm.9903>*



www.festval.de



UHH → CEN - Center for Earth System Research and Sustainability → ICDC → Research →
 SAMD - Archive for Standardized Atmospheric Measurement Data → Observational Data → Short Term Observations
 → FESSTVaL Campaigns
FESSTVAL: FIELD EXPERIMENT ON SUB-MESOSCALE SPATIO-TEMPORAL VARIABILITY IN LINDENBERG

Thanks to all external partners!

DLR, Uni. Tübingen, U. Wageningen,
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