

CEILINEX 2015

Ina Mattis + Ceilinox 2015 team



General objectives

Test performance and behavior of ALCs that are typically used in the E-PROFILE and TOPROF community

Quantitative comparison of backscatter profiles, signal-to-noise profiles and cloud data.

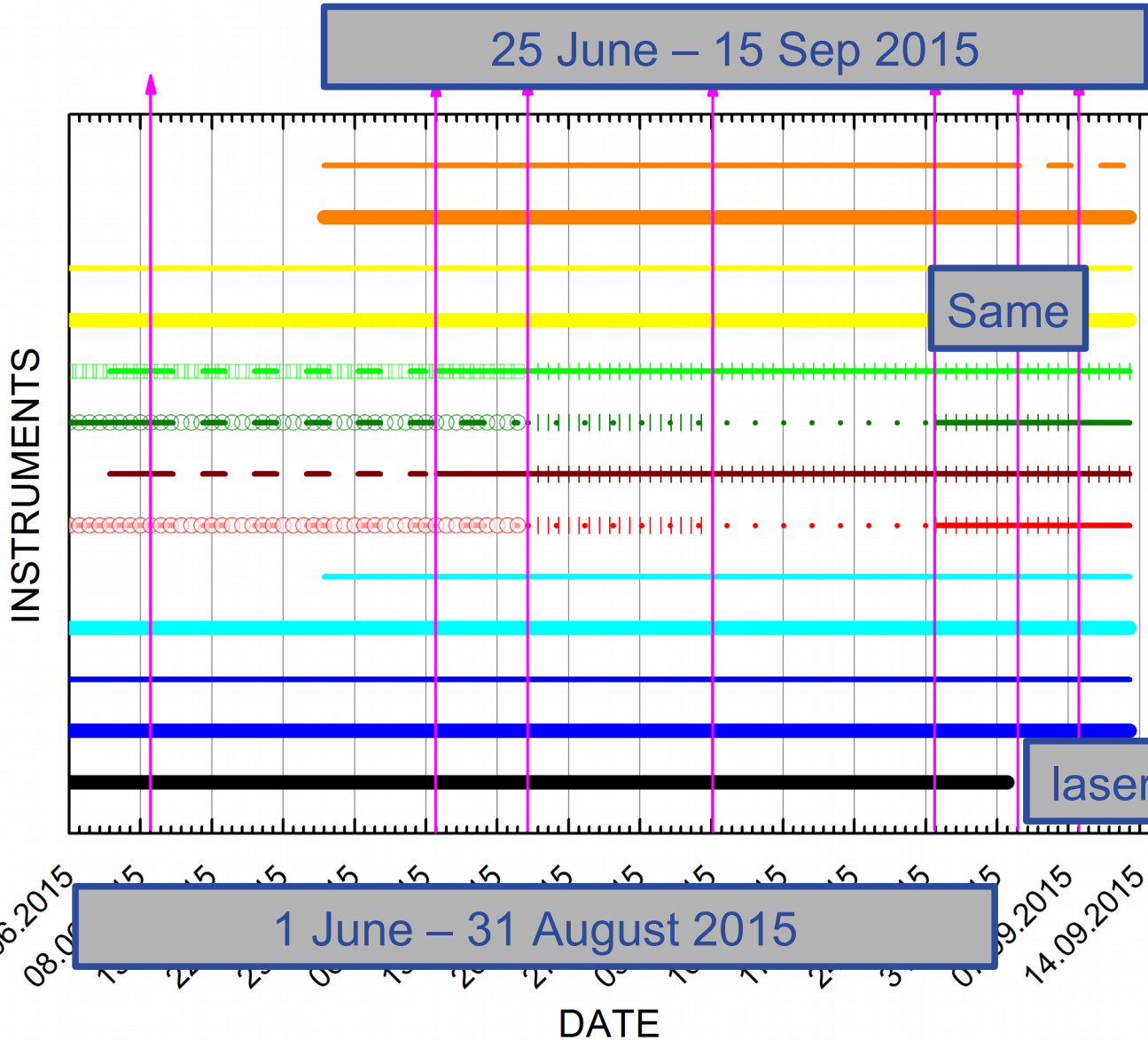
Open data exchange among participants is necessary and results of the campaign shall be made public.



Practical issues

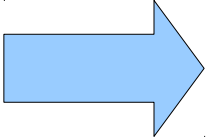
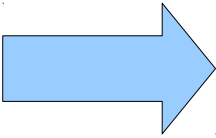




13 instruments, 2 of each ceilometer type



- RALPH
- CHM140101
- CHM100110
- CHX080082
- CHXMLU
- LD40002
- LD40003
- CS1vais
- CS2vais
- CS2mt004
- CL51RAO
- CL51RAOH2
- CL51RAOTP
- CL51RAOv1023
- CL51RAOalg1
- CL51CG
- CL51CGH2
- CL51CGTP
- CL51CGalg1
- CL31RAO
- CL31RAOH2
- CL31RAOTP
- CL31RAOv2018
- CL31RAOalg1
- CL31RUB
- CL31RUBH2
- CL31RUBTP
- CL31RUBsens1
- CL31RUBalg1

Different firmware versions → logbook

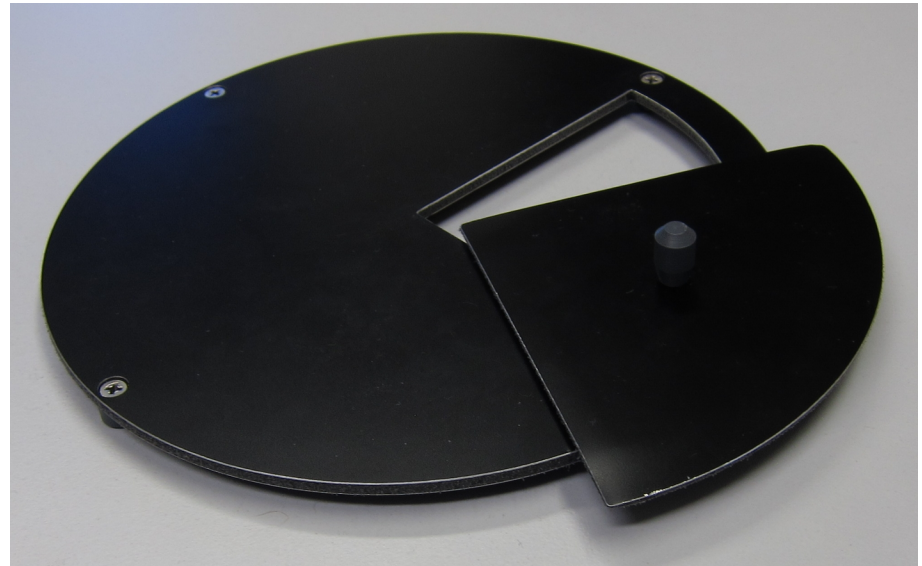
- instruments shall provide their standard profiling data and all additional (e.g. housekeeping) data that are provided in standard output. Data shall be as 'raw' as possible.
- Daily procedure:
 - All instruments send raw data to a data pool
 - DWD generates plots (quicklooks) according to the campaign goals
 - Time-height cross section of attenuated backscatter
 - Hourly profile comparison of attenuated backscatter profiles 
 - Daily comparison of cloud base heights
 - house-keeping data
 - Inspection / discussion of special events and meteorological conditions
 - generation of additional, special plots 
 - Publication (Ceilinex2015.de) 
 - Option for (public) discussions 

- Accounts coordinated by Frank
- at the moment, **only data since July 1** → Will be completed as soon as final amount of data is known (end of Oct)
- Ceilometer data (uncalibrated / with manufacturer calibration) in
 - NetCDF format (by Raw2L1, special thanks to Marc-Antoine and Ronny)
 - Original (ASCII) data format
- RALPH range-corrected signals at 1064 nm (NetCDF) → **calibrated attenuated backscatter and backscatter coefficients soon**
- Ancillary data
 - Radio-soundings (00, 06, 12, 18 UT)
 - Eye observations hourly (24/7) + meteo data (T, p, rh)
 - **Microwave profiles (not yet)**
 - **Sonic data (to be selected)**
 - AODs (340-1640 nm) ([see AERONET webpage](#))
- **Anything missing?**
- **What about results? e.g. calibration factors?**



→ Dark current

- Cover telescope but emit laser beam as usual
- Detect signal distortions in free troposphere which cause systematic errors in bsc profile and problems in Rayleigh calibration
- Successfully performed for all instruments, several firmware versions



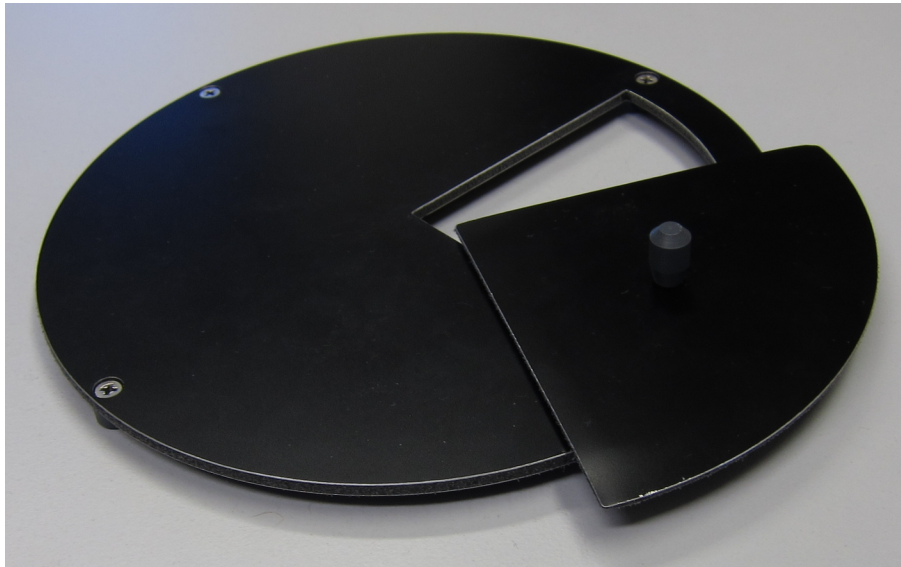
→ Horizontal

- Measure in horizontal direction
- Detect systematic problems in overlap region
- Requires horizontal homogeneous atmosphere (not possible at MOL)



→ Telecover

- Cover $\frac{3}{4}$ of telescope (rotating)
- Detect misalignments between laser beam and telescope (overlap)
- Only done for CHM

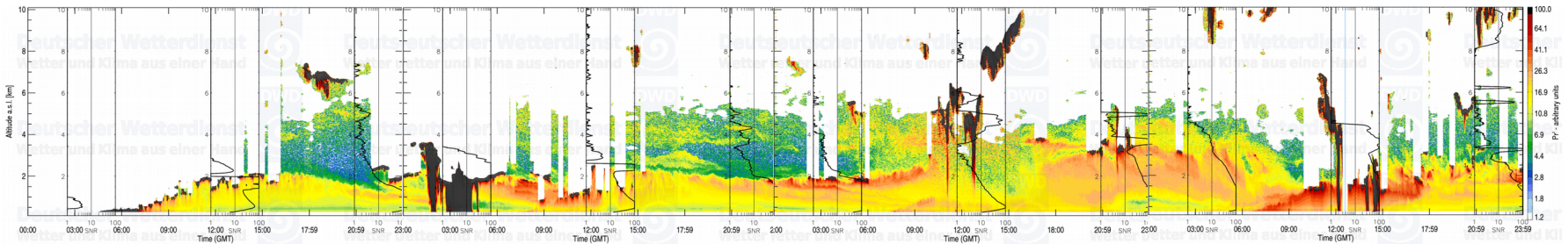


Saharan dust events

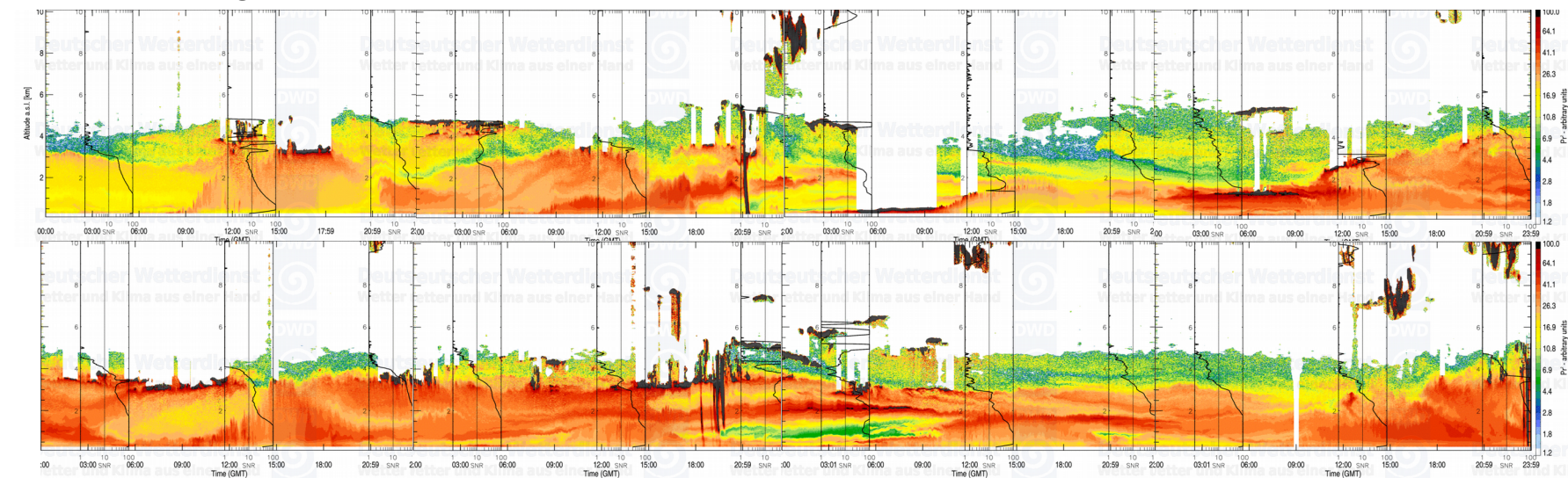


→ 12-14 June, 3-7 July

→ July 15-18



→ 6-16 August

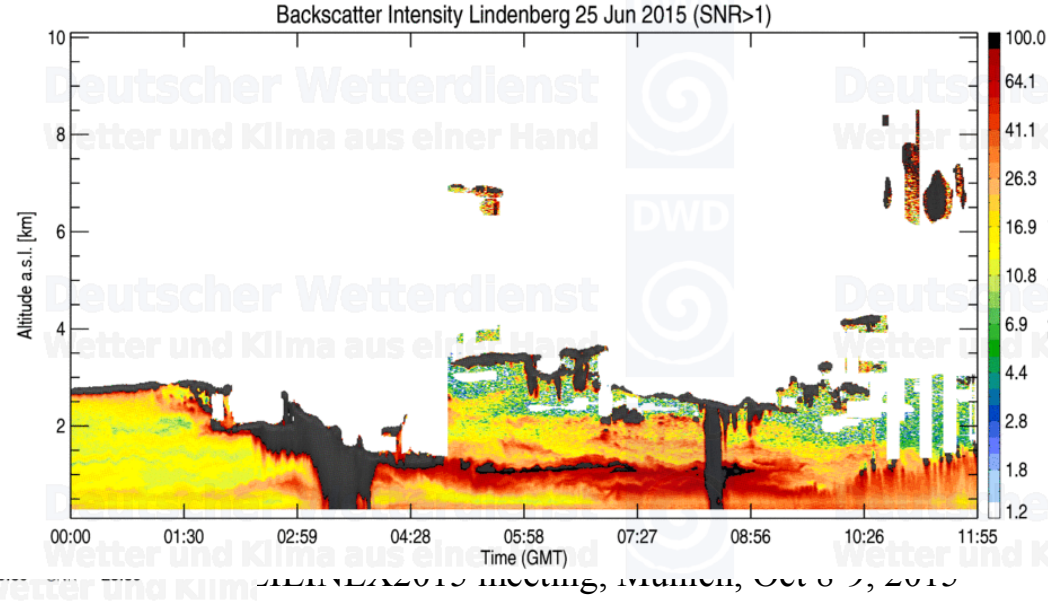
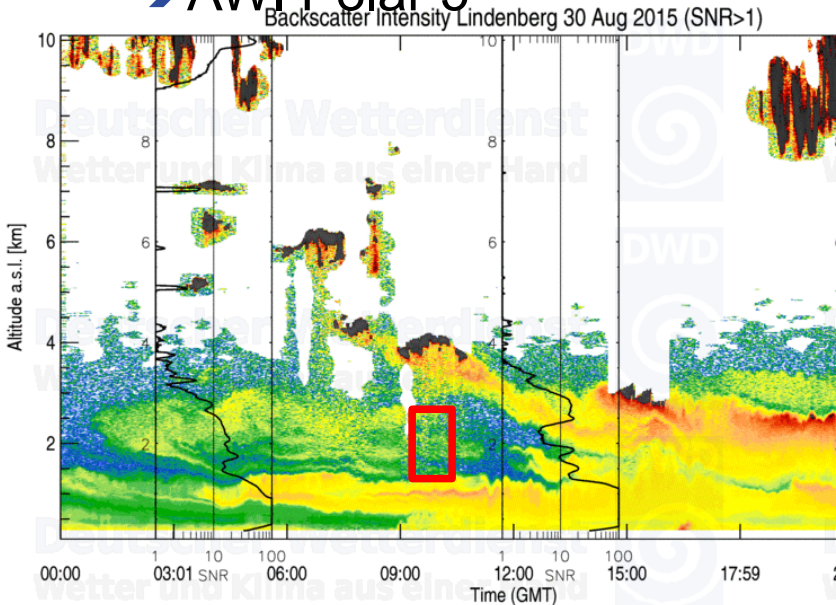
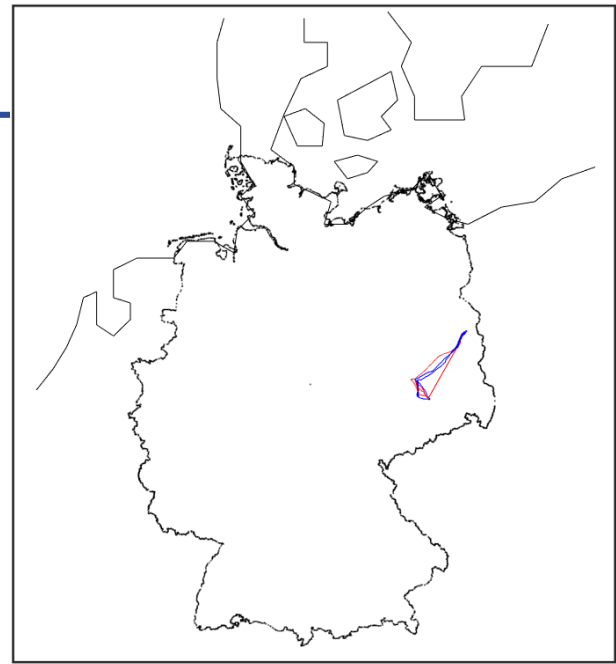


→ 30 August – 1 September



Aircraft observations

- 25 June, test of DWD volcanic ash equipment
 - Two aircraft with OPC
 - Partenavia (Enviscope)
 - Shortwing (FH Düsseldorf, Prof Weber)
- 30 August, test of new extinction instrument
 - Cavity Attenuation Phase Shift Instrument
 - Andreas Petzold, Forschungszentrum Jülich
 - AWI Polar 5



- Deployment was delayed
- Bugs and missing data formats in Raw2L1 were solved very fast
- Vaisala:
 - test of more firmware versions, algorithm options and parameters than originally planned
 - Only short time periods for each comparison option
- Campbell:
 - Instrument without data acquisition software
 - Vaisala mode possible (lower altitudes, negative values suppressed)
- No problems with our Lufft systems (because we know them)
- Less “nice weather situations” than expected (150% of climatological precipitation in July, cloud cover not increased)
- Collected many data, many new questions → more than we can analyze in next time



Milestones TO-PROF WG1, task7

Deutscher Wetterdienst
Wetter und Klima aus einer Hand



M1	circulate proposal among potential participants	January 2015	Done
M2	Circulate questionnaire about already existing datasets of collocated measurements of different ALCs	January 2015	Done
M3	Detailed experiment plan	April 2015	Done
M4	Perform experiment	June-Sep 2015	Done
M5	Preliminary report of experiment, including compilation of complete dataset	Sep 2015	
M6	Report on already existing datasets of collocated measurements of different ALCs	Dec 2015	
M7	Final report of experiment results	July 2016	

SWG: Sep/Oct 2015: meeting to discuss results and prepare report/publication



Dankeschön

