

PROBE NEWS

WINTER 2020-2021

WINTER PROBE NEWSLETTER!

Here you will find the latest updates on the topic of Profiling the Atmospheric Boundary Layer (ABL) at European scale.



FLASH NEWS

- Successful plenary meeting in December 2020 attracted more than 100 participants
- Sub-working groups established on *complex terrain* and *urban environments*
- *Short-term scientific missions* are connecting scientists remotely



PROBE 2020



The numerous PROBE activities in 2020 peaked at the online plenary meeting on 9-11th December. The meeting attracted a diverse list of over **100 participants** including manufacturers, scientists, instrument operators, national meteorological and hydrological services, environmental agencies and various end-users. The plenary presentations highlighted that **ground-based profiling can benefit a wide range of applications, including the assessment of greenhouse gas emissions, renewable energy, weather forecasting and chemistry transport modelling**. During breakout sessions, the four PROBE working groups defined clear strategies for the **coordinated use of measurement networks** and the **development of advanced ABL products**.



NEW SUB-WORKING GROUPS

Two new sub-working groups were established to address ABL characteristics in specific settings: **Complex terrain** and **urban environments** (email us at info@probe-cost.eu to join!)

Let's discuss the specific challenges of operating remote sensing instruments and algorithms in these settings. How can we optimize network design? What are the advanced products required for the various applications (e.g. climate, weather, air quality, energy, or air traffic security)?

ABL PRODUCT DEVELOPMENT

Experts and users from different fields are coming together to develop advanced products concerning cloud and aerosol properties, temperature, humidity and wind profiling, atmospheric boundary layer characterisation, and high impact weather alerts. (join a dedicated sub-working group now by writing to info@probe-cost.eu !)

The 350-stations network of automatic lidars and ceilometers within EUMETNET's E-PROFILE program could showcase its ability for 4-dimensional tracking of aerosol plumes in the events of the **Saharan dust outbreaks** that touched large parts of Europe in February 2021. The visual tracking benefits from the recent homogenization of the measurement network and data processing. PROBE is working towards an automatic aerosol tracking algorithm (in altitude, time, and space) to exploit the dense profiling network even more effectively in the future.

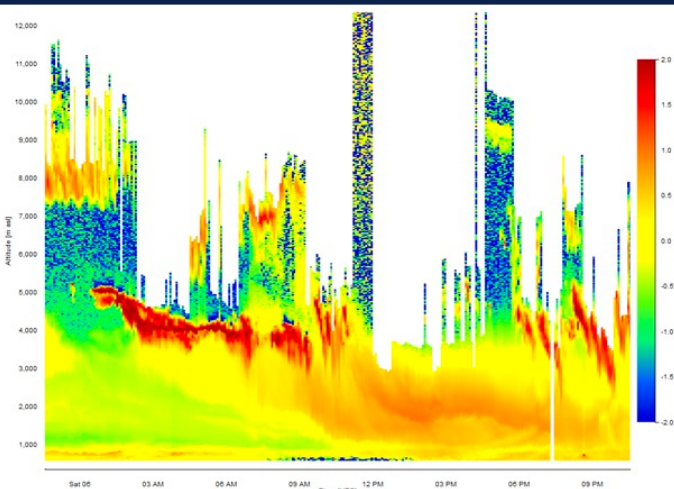


Fig.1 Attenuated backscatter observed on 06 Feb by the E-PROFILE ALC in Bern, Switzerland, in proximity to the location of the picture in Figure 2. (source: <https://bit.ly/3b3G1fr>)



Fig.2 Strong limitation in visibility and atmosphere in reddish colours in the Swiss prealps. (source: <https://bit.ly/3b3G1fr>)

STANDARD OPERATING PROCEDURES AND NETWORKS

- To optimize exploitation of the various sensor networks, PROBE sub-working groups on microwave radiometers (MWR), Automatic Lidars and Ceilometers (ALC), Doppler Wind Lidars (DWL), Doppler Cloud Radars (DCR), and drone-based profiling are formulating guidelines for operating the instruments. (join a working group: info@probe-cost.eu)
- Activities are supported by a growing involvement of instrument manufacturers.
- In preparation: an overview on European boundary layer profiling networks! This living document will be updated regularly to provide state-of-the-art guidelines on best practices for sensor operations, data formats and quality control.

UPCOMING EVENTS

Introductory lectures for a general audience

We will start with events introducing you to the powerful tools of surface remote sensing for advanced Atmospheric Boundary Layer (ABL) profiling.

- [Instruments for profiling the ABL](#)
Tue 13/04/2021 15:00-16:30 CET
- [Ground-based remote sensing instrument networks](#)
Tue 25/05/2021 15:00-16:30 CET

Target audience: [general public](#)

Expert discussions

For those interested in more in-depth discussions, the PROBE working group on advanced profiling products is inviting everyone to join technical discussions.

Target audience: [experts and those who want to become experts](#)

[Check our events here!](#)



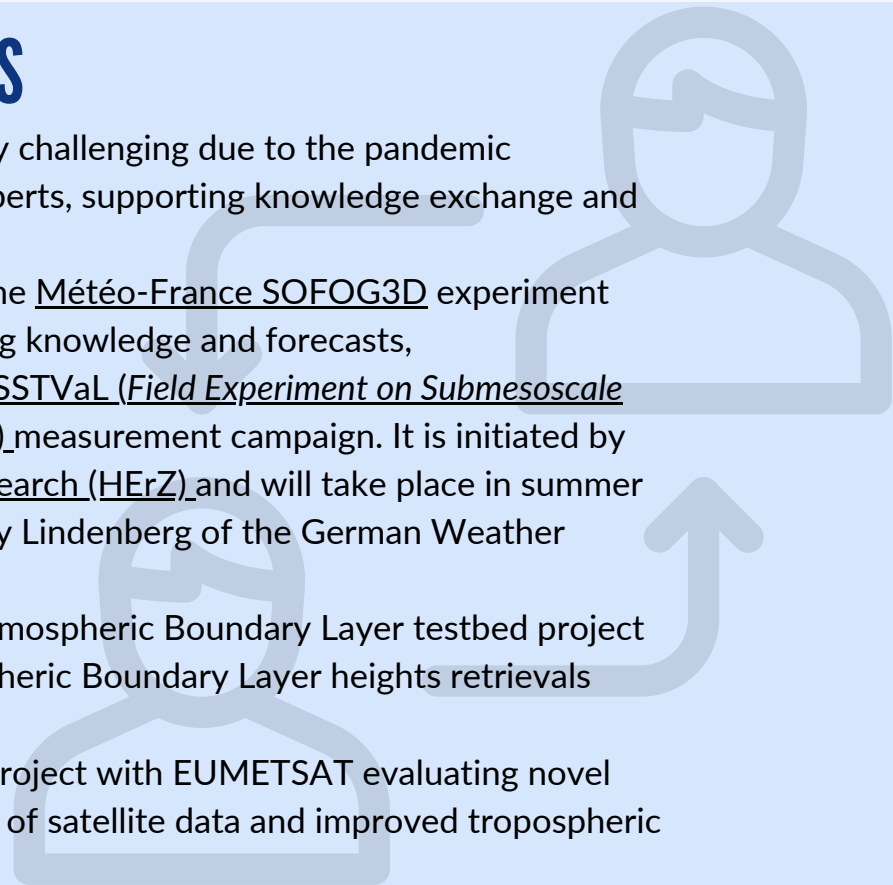
SHORT-TERM SCIENTIFIC MISSIONS (STSM)

STSMs are a tool to connect scientists and facilitate knowledge exchange. Now STSMs can take place remotely. Do you want to work with an expert in another country on a specific topic? Early career investigators ([ECI](#)) are especially encouraged to apply. [Here](#) you find a list of current STSM topics - you are welcome to formulate your own!

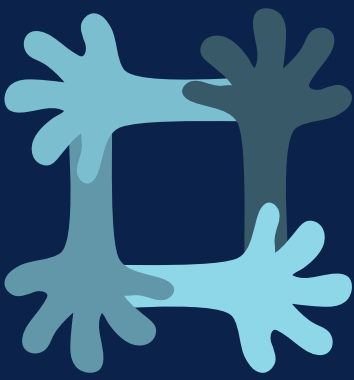
FOSTERING COLLABORATIONS

Finding new research partners is particularly challenging due to the pandemic restrictions. PROBE is bringing together experts, supporting knowledge exchange and fostering new collaborations.

- PROBE members have participated in the [Météo-France SOFOG3D](#) experiment during winter 2019-2020 to improve fog knowledge and forecasts,
- PROBE is supporting the upcoming "[FESSTVaL \(Field Experiment on Submesoscale Spatio-Temporal Variability in Lindenberg\)](#) measurement campaign. It is initiated by the [Hans-Ertel-Center for Weather Research \(HERZ\)](#) and will take place in summer 2021 at the Meteorological Observatory Lindenberg of the German Weather service (DWD),
- PROBE is supporting the E-PROFILE Atmospheric Boundary Layer testbed project to evaluate the performance of Atmospheric Boundary Layer heights retrievals from ALC measurements,
- PROBE contributes to a new research project with EUMETSAT evaluating novel methods for the operational monitoring of satellite data and improved tropospheric profiling (starting March 2021).



BECOME INVOLVED!

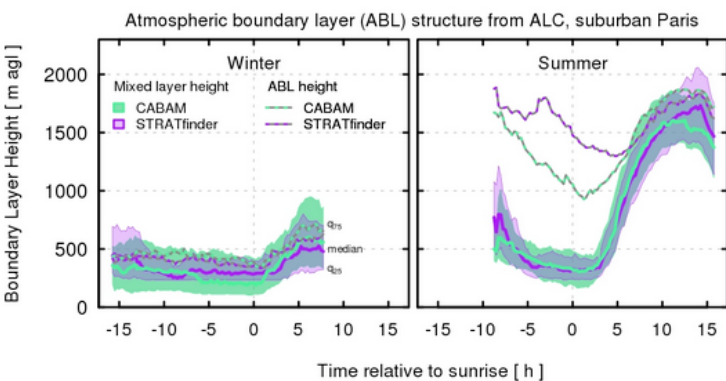


There are several ways for you to get engaged with the action:

- We want to support a diverse user community. Tell us about your needs - become a [PROBE user!](#)
- We want to learn from each other. Short-term scientific missions (STSM) are a great way to foster collaborations across Europe. [Apply for one!](#)
- Are you an early-career investigator (ECI) from an Inclusiveness Targeted Country (ITC)? [Apply](#) for funding for international conferences, even online!
- We are actively working to enlarge instrument networks, improve performances, as well as to enhance sensor synergy for new and better profiling products. You want to contribute? [Join](#) one of the four PROBE working groups (WG)!

RECENT PUBLICATIONS

PROBE members are editing a special issue on the topic of “Coastal and Urban Meteorology” in the journal *Atmosphere*, deadline 25 May 2021 (click [here](#) to see the call for submissions)



KOTTHAUS S., HAEFFELIN M., DROUIN M.A., DUPONT J.C., GRIMMOND S., HAEFELE A., HERVO M., POLTERA Y., WIEGNER M., 2020

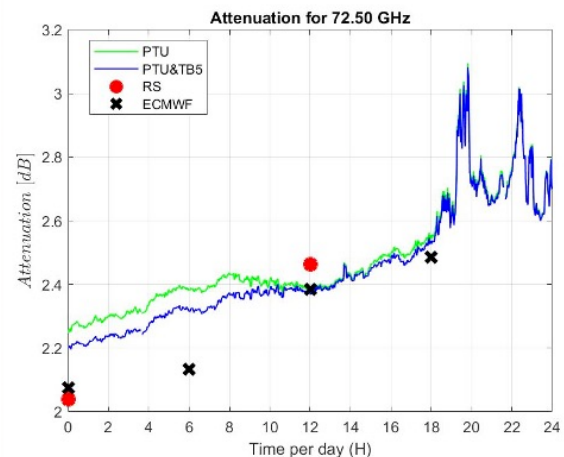
TAILORED ALGORITHMS FOR THE DETECTION OF THE ATMOSPHERIC BOUNDARY LAYER HEIGHT FROM COMMON AUTOMATIC LIDARS AND CEILOMETERS (ALC)

REMOTE SENS, 12, 3259, DOI: 10.3390/RS12193259, [HTTPS://WWW.MDPI.COM/2072-4292/12/19/3259](https://www.mdpi.com/2072-4292/12/19/3259)

ALYOSEF, A., CIMINI, D., LUINI, L., RIVA, C., MARZANO, F. S., BISCARINI, M., MILANI, L., MARTELLUCCI, A., GENTILE, S., NILO, S. T., DI PAOLA, F., AND ROMANO, F.:

IMPROVING ATMOSPHERIC PATH-ATTENUATION ESTIMATES FOR RADIOPROPAGATION APPLICATIONS BY MICROWAVE RADIOMETRIC PROFILING,

ATMOS. MEAS. TECH. [PREPRINT], [HTTPS://DOI.ORG/10.5194/AMT-2020-309](https://doi.org/10.5194/amt-2020-309), 2021.



WHAT IS PROBE? [PROBE](#) is a new European COST action aiming at strengthening and harmonizing methods and procedures to yield high quality observational data of the atmospheric boundary layer (ABL). It will broaden the bridge between a wide range of user needs and the science and technology expertise residing in industry and academia. For more details see [Cimini et al. 2020](#), [BAST](#)



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Acknowledgement

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COST description

COST (European Cooperation in Science and Technology) is a funding agency for research and innovation networks. Our Actions help connect research initiatives across Europe and enable scientists to grow their ideas by sharing them with their peers. This boosts their research, career and innovation.

Weblink

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