GeoSphere Austria
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c/o Sonnblick Observatorium
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Email: elke.ludewig@geosphere.at
Allocation: Intercomparison
Date: 24-01-08

2nd CIS Intercomparison for LWC
05.08-27.09.2024

Content

1 Background

GeoSphere Austria is the Austrian geological, geophysical, climatological and meteorological service which is operating the Sonnblick Observatory in the Austrian Alps since 1886.
On 25th October 2018 the IAC approved us as one of the host candidates for ACTRIS Topical Centre for Cloud In Situ Measurements (TC CIS).
On 9th November 2020 IAC approved ACTRIS TC CIS and commissioned the implementation.

The European Centre for cloud ambient Intercomparison (ECCINT) is one out of 4 units being part of TC CIS. ECCINT is within the implementation phase and should be operational by 2025/2026. The TC CIS Unit is responsible for the retrieval of cloud probes, capable of monitoring the mandatory variables cloud liquid water content and cloud droplet effective diameter.

2 Our Mission

The objective to provide continuous long-term ambient cloud in situ data for Europe requires the monitoring power of the National Facilities (NFs) for cloud in situ.

ECCINT has the mandate to support these National Facilities (NFs) in monitoring the mandatory variables

- Cloud liquid water content (LWC)
- Cloud droplet effective diameter (D_e)

- LWC & D_e derived from Cloud droplet spectra's

These in situ measurements remain yet to be captured in long-term monitoring, which is why we endeavor to develop operational monitoring together with all potential NFs. We seek your support!

Within the next two years, we will setup recommendations for instruments, data management and Standard Operating Procedures (SOP's).

In-Situ Intercomparisons and chamber campaigns should provide the scientific basis for the standardization of the mandatory variables LWC and D_e and the recommendation of potential monitoring instruments. For this purpose, we want to accomplish our 2nd Intercomparison campaign.

3 2nd CIS ECCINT Intercomparison

3.1 AIM

The aim of our second Cloud In Situ Intercomparison, organized by ECCINT, is

- to improve the procedures implemented during INT-01
- to check the instrument performance under warm conditions
- to be able to recommend instruments for ACTRIS CIS
- to obtain SOPs for the participating instruments
- to prepare a first report draft for each participating instrument

In addition to cloud In Situ measurements on the roof terrace a vertical profiling campaign by cable car will take place in order to:

- investigate the vertical profile during cloud events
- observe the cloud microphysical structure at the cloud base
- learn more about Cloud Aerosol Interactions
- verify vertical profiles derived from Ceilometer data

3.2 Scientific Excellence

Clouds and cloud properties are listed as essential climate variables (ECVs). Due to the significant value of LWC in terms of cloud types, as well as its potential for analyzing climate interactions, LWC is listed as a mandatory variable in ACTRIS.

The outcome of pilot intercomparison 1 (ECCINT-01) in autumn 2022 brought out significant discrepancies between the participating instruments. Harsh weather conditions and different measurement setups lead to different results in terms of the integrated cloud liquid water content. Moderate conditions in warm clouds without mixed phase conditions should bring out suitable results for ECCINT-INT02 in summer 2024.

In addition to instrumental intercomparisons, SOPs and quality standards for the instruments will be discussed and improved. The LWC measurement campaign will take place in combination with a pilot vertical profiling campaign by cable car, which connects the observatory with the valley bottom. Thus,

in addition to the entire monitoring pool (e.g. aerosol data) of the SBO, another data set will give feedback for analysis of the vertical structure of the atmospheric boundary layer.

The focus will be on measurement techniques and their application to future ACTRIS National Facilities for cloud in situ. The results of the campaign will on the one hand support the implementation phase of ACTRIS-CIS and on the other hand contribute to ACTRIS research and innovation.

3.3 Schedule

For **ECCINT-INT02** we plan a time window from 05.08.2024- 27.09.2024 until we have at least:

- **5-10** suitable cloud events or
- **40-80** h of total occurrence.

Please consider: You are very welcome but **you do not have to come in person or stay the whole time!** We will keep you updated for those who are not attending in person!

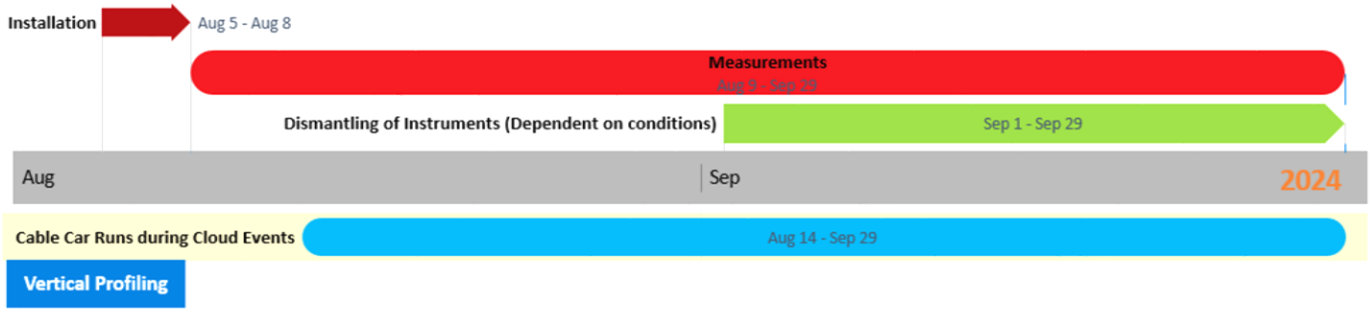

Figure 1: Timetable ECCINT-INT-02

Travel & Arrival	• Airport: Salzburg • Train: Salzburg & Taxenbach From Salzburg or Taxenbach we will arrange a transport to the station. • Car: Address: Kolmstraße 6, 5661 Rauris (please consider: we may not able to support car expenses (gas/km)!)
setup instruments & calibration	It would be helpful if you can come to the station to help to setup your instrument. If this is not possible, please let us know if we are able to do so. If you need you can leave once your instrument is running and come return for dismantling (if traveling make sense!). We will have various instruments measuring LWC.
measurements	Data retrieval; please consider, depending on weather we will use the backup time in September as well. If you want, you can extend the measurement series beyond that and choose the dismantling time by yourself.
Workshops: QA, SOPs, etc.	Agenda will follow, we will discuss each instrument and corresponding procedure as well as ongoing action within ACTRIS. Hybrid meetings are possible.
discussions/trip to Salzburg/side events/data management	

data analysis & reporting	Preparation of the final report of the measurement campaign, data visualization and analysis.
Calibration & dismantling instruments	Dismantling of instruments and preparation for logistical transport. If you are unable to attend, let us know if we can organize the dismantling and shipping of the instruments.
Leaving & travel	We will arrange the transport to the airport/train stations.

3.4 Financing

The Intercomparison campaign can be supported via the transnational access (TNA) programs supported by the EU project "ATMO-ACCESS". Unfortunately, you have to apply for TNA by your own. **We will support you with information and templates for the application to make it as easy as possible for you.**

The TNA will cover your travel costs and accommodation. Depending on the need and prices, we may can cover transport costs of instrumentation as well. If you have own money to support, please feel free to reduce the claim of access costs within the application.

The next **ATMO-ACCESS general call** will start in February 2024. We will update you with all necessary informations. Further informations on ATMO-ACCESS are available under: https://www.atmo-access.eu/plan-your-access-using-our-call-schedule/

Costs:
In dependence on your travel (flight/train) and where you like to stay (in the valley or on the mountain) we are estimate about 2.200€/Person for 12 days.

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3.5 Location & Weather & Accommodation

The Intercomparison will take place at the Sonnblick Observatory at Mt. Hoher Sonnblick, 3.106m asl.

Ground based measurements will be carried out on the Roof terrace of the building mainly on the south-eastern part above the summit station of the Cable car.

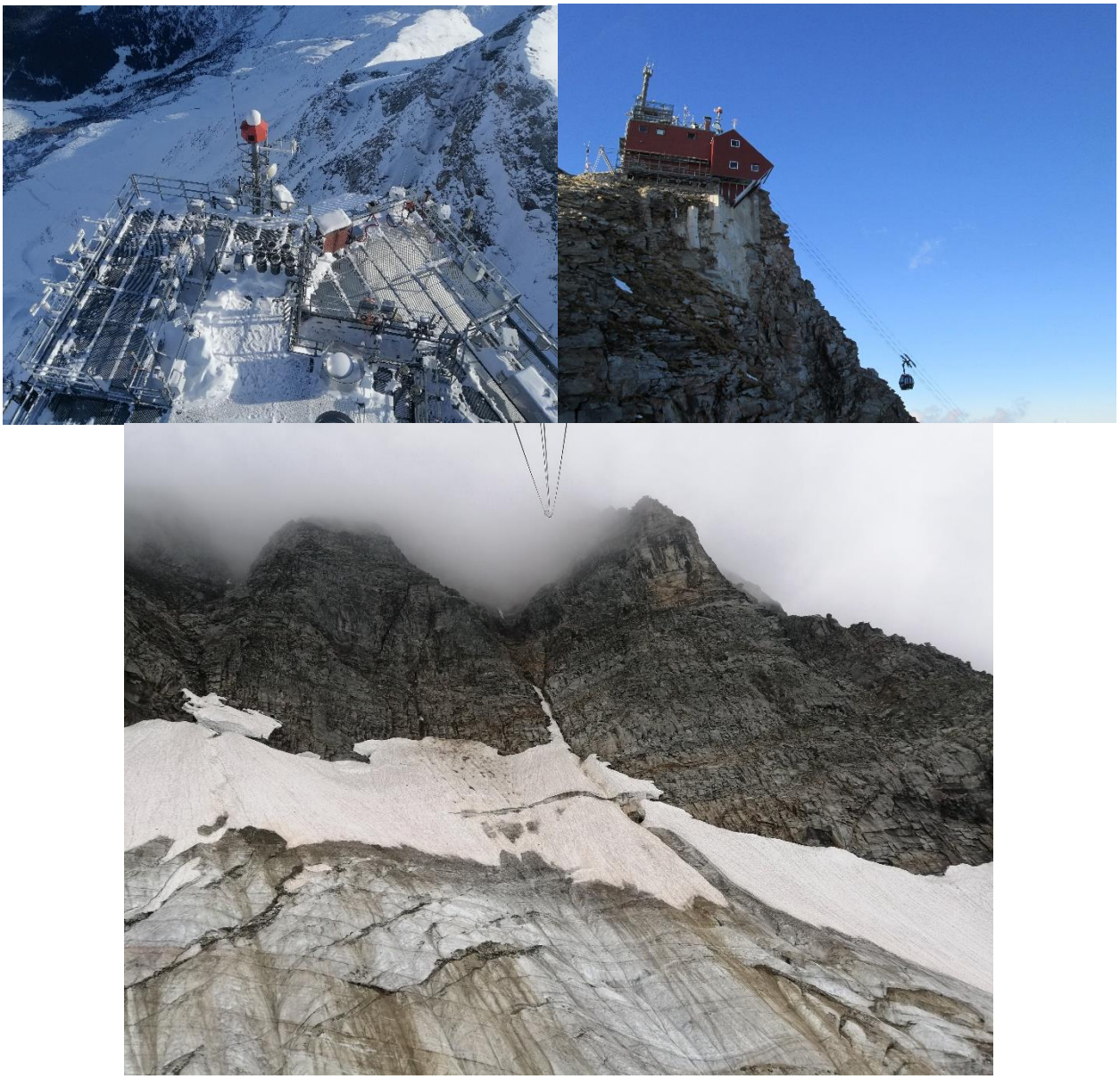

Figure 2: Roof terrace of the Sonnblick Observatory (upper left), cable car (upper right) and cable car perspective while going upwards

You can find more information about the Observatory on www.sonnblick.net. Please bring warm winter clothes and boots with you! Accommodation is available at the Zittelhaus hut (http://www.zittelhaus.at/) next door to the Observatory or in the valley Kolm Saigurn (https://www.sonnblickbasis.at/).
You can check out the station virtual "The Sonnblick Observatory on 360°":
https://www.sonnblick.net/en/the-observatory/360-tour/

4 Instruments

We are in contact with various institutions planning to provide following instruments:

Cloud In-Situ:

- Gerber PVM-100
- Vaisala PWD52
- DMT FM-120
- DMT GFAS-DPOL
- ICEMET
- Palas CDA
- ETH Holimo II
- Promo3000

Vertical profiling:

- PVM-100
- Mini OPC (FMI)
- Mini CDA (FMI)?
- Partector TEM sampler (ETH)
- Promo 3000 Welas
- Smallino?
- uICEMET?

The **final** instrumentation will be announced in Spring 2024. The final setup and all necessary specifications will be discussed and finalized by the participants during the next ECCINT workshop.

5 Participants

Following institutions showed interest in joining the campaign so far:

Institution	Suggested call
Will be updated during Kickoff-Meeting	

We will arrange a meeting in spring 2024 to support your application in ATMO-ACCESS if needed!

6 Contact

If you have any questions, do not hesitate to contact us!

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