ACTRIS
CCRES

New developments at CLU

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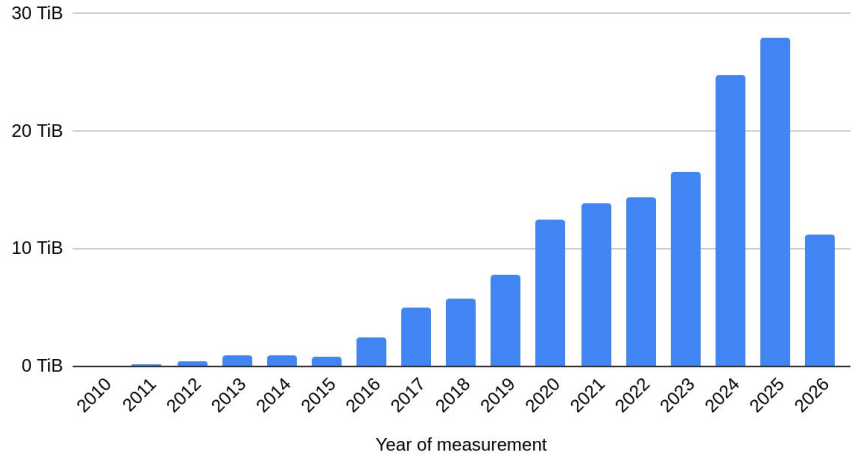
Finnish Meteorological Institute

CCRES/CLU Spring Workshop, online, 1st and 2d of June 2026

Cloudnet statistics



145 TB raw data

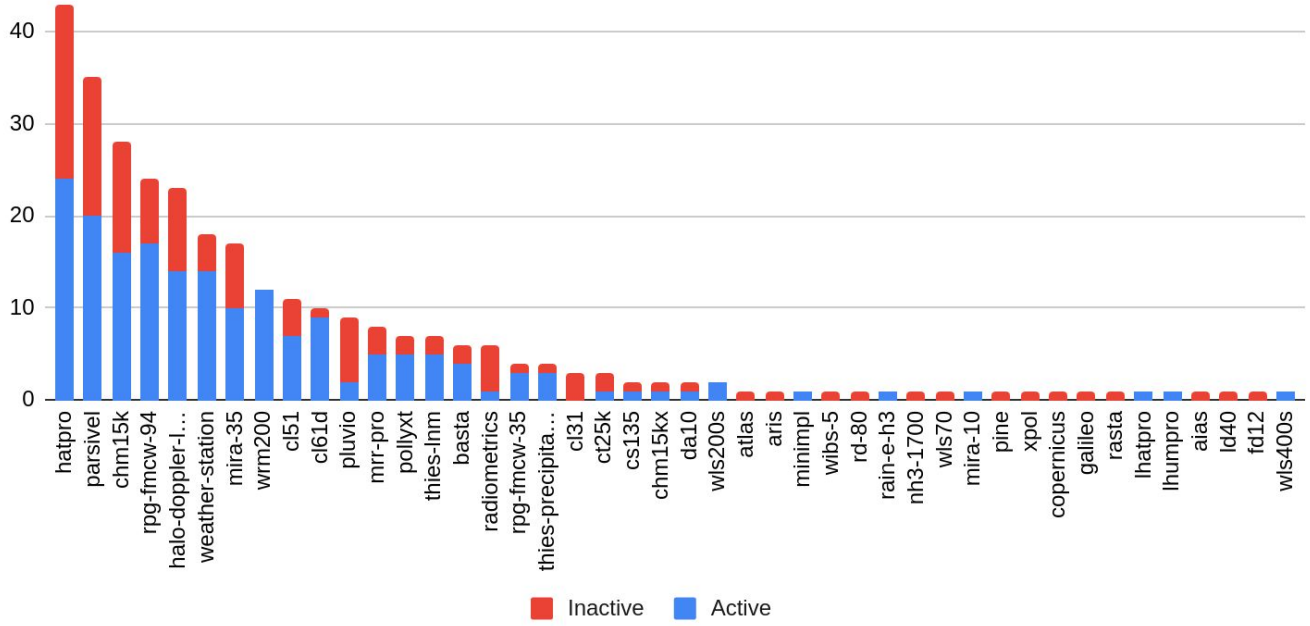
~600 visitors / week

Year	Downloads
2026	4,289,795
2025	9,196,143
2024	3,374,326
2023	1,053,820
2022	357,491
2021	318,643

Year	Unique IPs
2026	2,356
2025	3,214
2024	1,981
2023	869
2022	414
2021	198

Cloudnet instrument PIDs

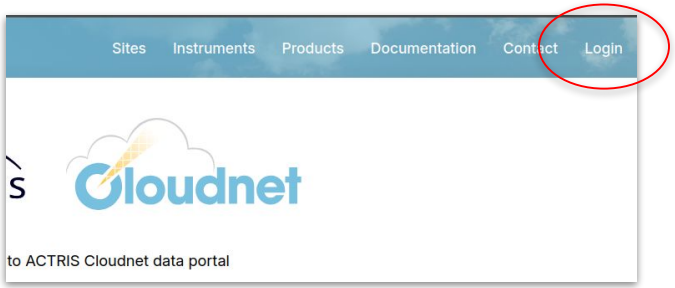
- 305 registered instruments (183 active 123 inactive)
- Instrument PID is a crucial part of processing workflow

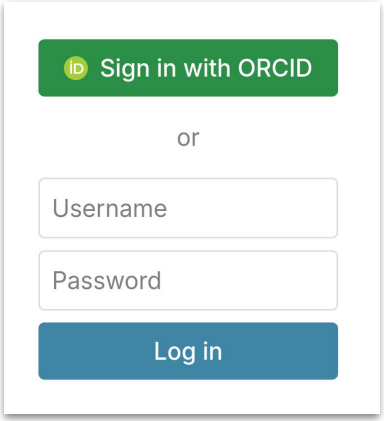


Authentication and permissions

- Login options:
  - ORCID
  - username / password

- Permissions:
  - Log in
  - Submit data
  - Write logs
  - Read logs
  - Read stats
  - Admin stuff
  - …





https://cloudnet.fmi.fi/login

Instrument logbook

GUI/API

Cloudnet

API

- Installation / removal
- Calibration
- Maintenance
- Malfunction
- Note
- Check
- …

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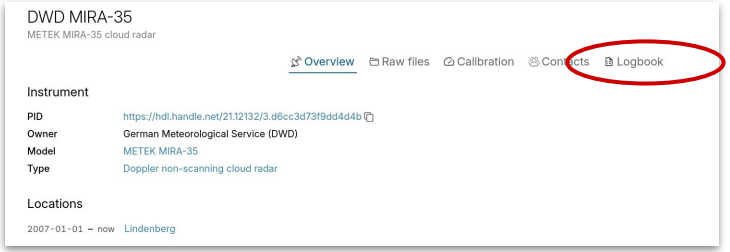
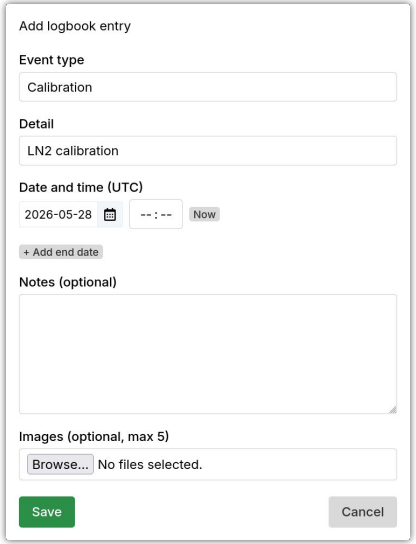
XLSX

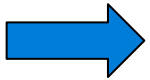
CCRES

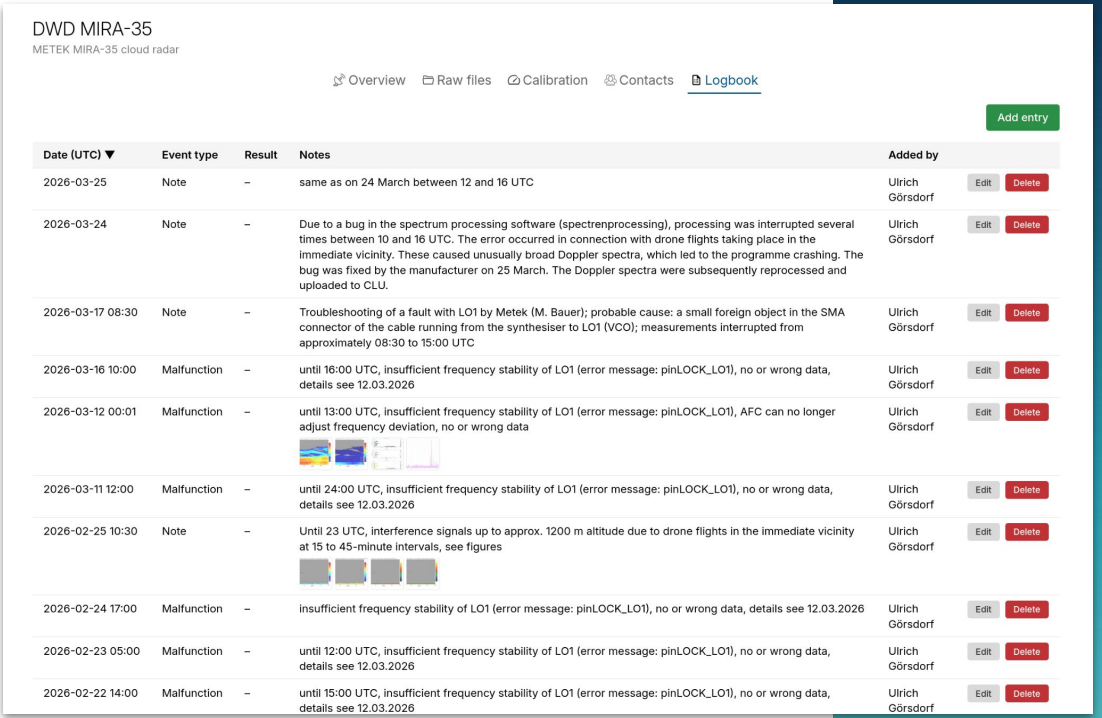
Cloudnet logbook GUI



1. Log in
2. Make sure you have permissions

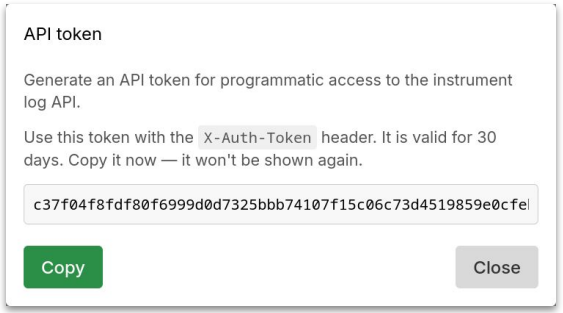


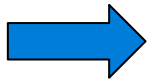




Cloudnet logbook API

1. Generate access token (valid for 1 month)
2. Use API to import old log entries





cloudnet-logbook-import.py

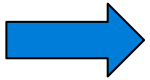
```python
"""
Bulk import old instrument logbook entries via the Cloudnet dataportal API.
"""

import requests

BASE_URL = "https://cloudnet.fmi.fi"

# Replace with the actual instrument PID for your instrument
INSTRUMENT_PID = "https://hdl.handle.net/XXXXXXXXXX"

# Old entries to import. Dates must be historical.
# eventType options: calibration | check | installation | maintenance | malfunction | note | removal
# result is only used (and required) for "check" events: "OK" or "Fail"
# notes is required when eventType="note", detail="Other", or result="Fail"
ENTRIES = [
    {
        "eventType": "installation",
        "date": "2020-03-15T09:00",
        "notes": "Initial installation on rooftop.",
    },
    {
        "eventType": "maintenance",
        "date": "2021-06-10",
        "detail": "Cleaning",
        "notes": "Cleaned dust from the instrument.",
    },
    {
        "eventType": "check",
        "date": "2022-01-20T14:30",
        "result": "OK",
    },
]


def post_entry(headers: dict, entry: dict) -> None:
    payload = {"instrumentPid": INSTRUMENT_PID, **entry}
    response = requests.post(
        f"{BASE_URL}/api/instrument-logs", json=payload, headers=headers
    )
    if response.ok:
        data = response.json()
        print(f"  Created entry id={data['id']}  {entry['eventType']}  {entry['date']}")
    else:
        print(f"  ERROR {response.status_code}: {response.text}  (entry: {entry})")


def main():
    # How to get the token:
    # 1. Log in to https://cloudnet.fmi.fi
    # 2. Click your profile icon → "API token" → "Generate"
    # 3. Copy the token value
    token = "XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX"
    headers = {"X-Auth-Token": token}

    print(f"Importing {len(ENTRIES)} entries for instrument {INSTRUMENT_PID}...")
    for entry in ENTRIES:
        post_entry(headers, entry)
    print("Done.")


if __name__ == "__main__":
    main()
```

https://gist.github.com/tukiains/984eb41a12af24ee1d00f53830502464

Cloudnet logbook API

- Permanent access with username / password
  ⇒ CCRES can monitor logs

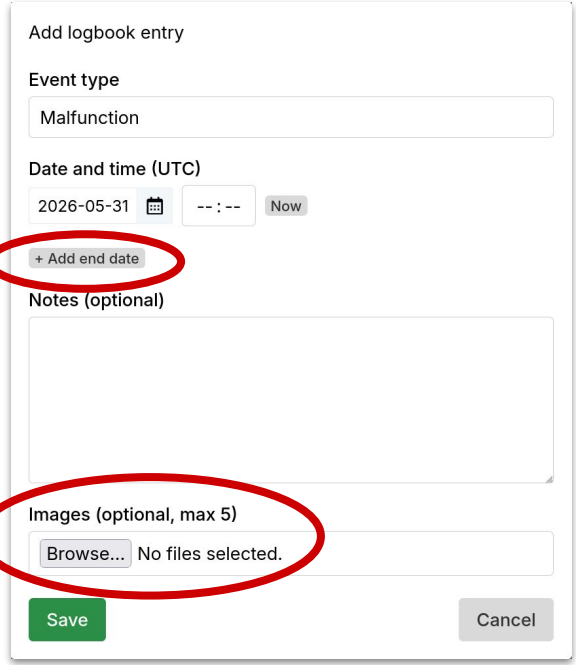
https://cloudnet.fmi.fi/api/instrument-logs?instrumentPid=https://hdl.handle.net/21.12132/3.70dd09553d13484d



Beta testing so far

- 18 users
- 410 log entries
  - 122 maintenance
  - 83 malfunction
  - 80 check
  - 64 calibration
  - 40 note
  - 26 installation
  - 4 removal

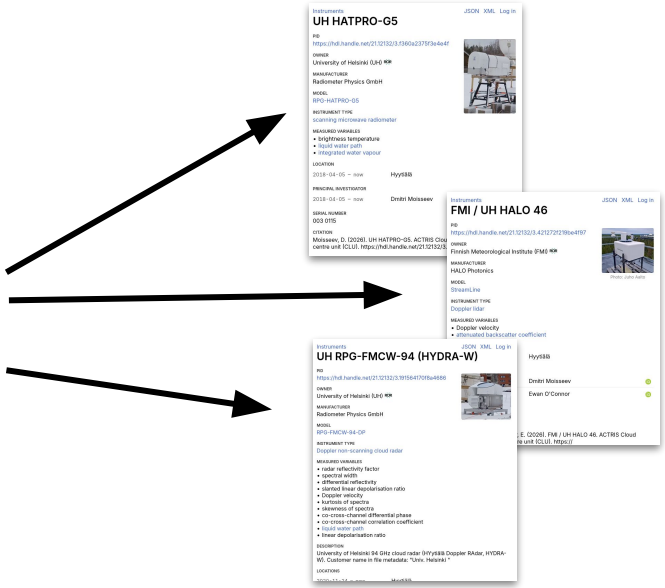
- Based on feedback:
  - Optional time range for all event types
  - Option to add images



Access to logbook?

- **Inform CLU which people need access to which instruments**

ORCID:
0000-0002-0651-4622



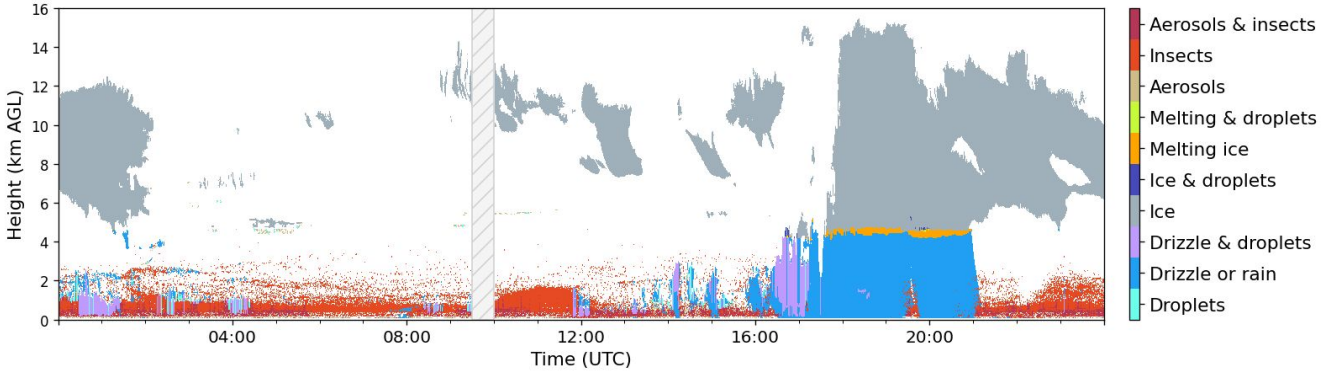
actris-cloudnet@fmi.fi

New sites

New Cloudnet sites:

- ATTO-Campina, Brazil
- Melpitz, Germany

ATTO-Campina, 2026-03-29

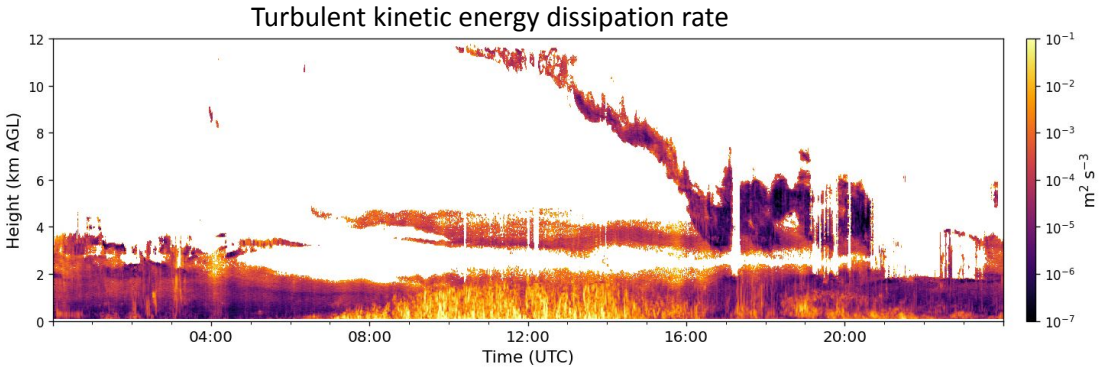


Campaign data from:

- Invercargill, New Zealand
- Tāwhaki, New Zealand
- Falkenberg, Germany

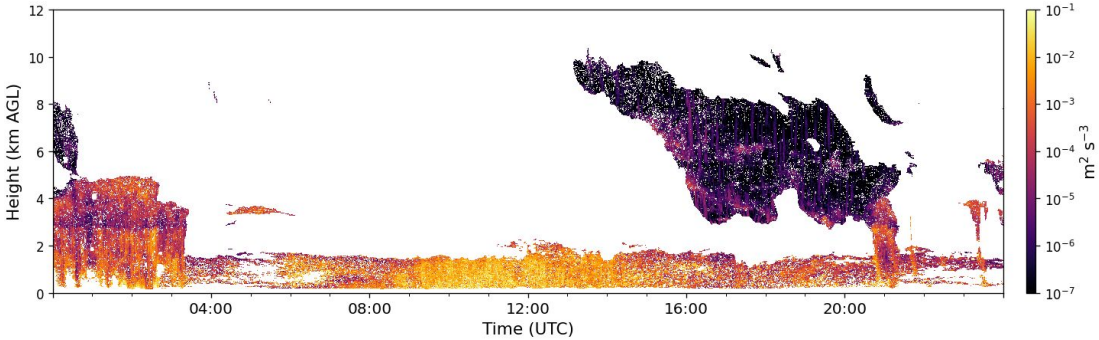
Turbulence products

From **Doppler lidar**



Based on: O'Connor et al. (2010)

From **radar** and **model**

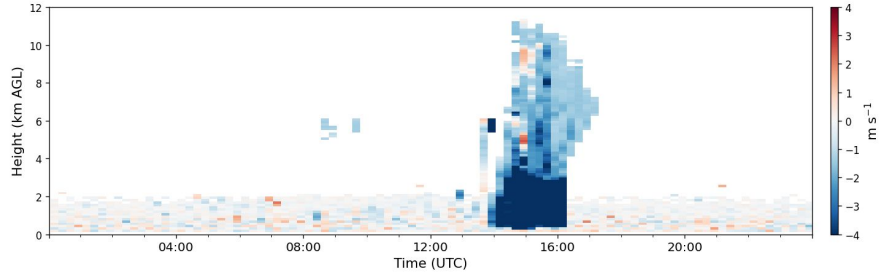


Based on: Griesche et al. (2020)

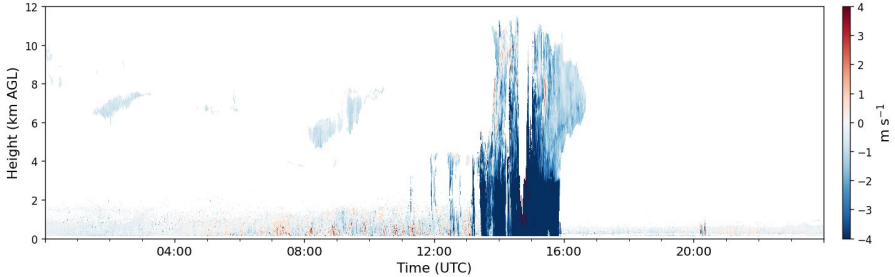
Bucharest, 2025-05-08

Vertical weather radar data

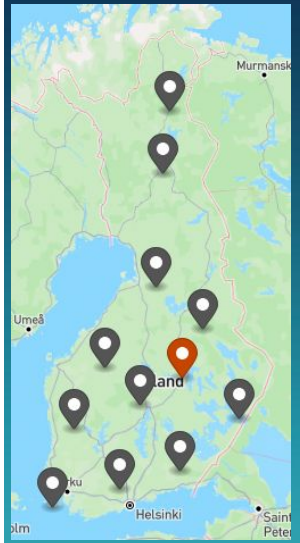
Doppler velocity, 2025-08-01



Vertical-pointing “birdbath scan” from FMI weather radar (5.6 GHz) in Kuopio, Finland



MIRA (35 GHz) in Vehmasmäki



Model data

Model data coming to Cloudnet:

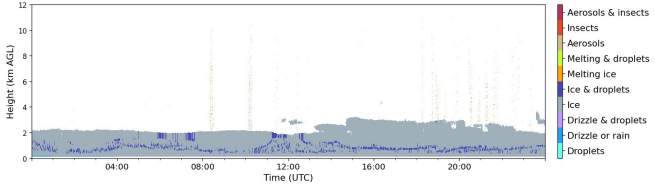
- AROME (Météo-France)
- ARPEGE (Météo-France)
- ERA5 (ECMWF)
- ICON-D2 (DWD)
- IFS (ECMWF)
- …
- AROME-Arctic (MET Norway)
- MEPS (FMI, SHMI, MET Norway)

Different models could be used in processing depending on the site / region.

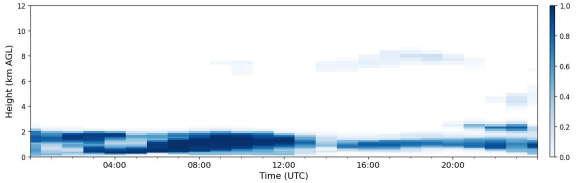
Model evaluation is planned in the future.

Ny-Ålesund, 2026-05-26

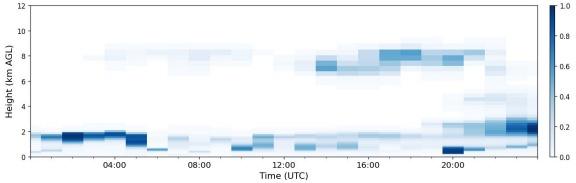
Target classification from measurements



Cloud fraction from IFS

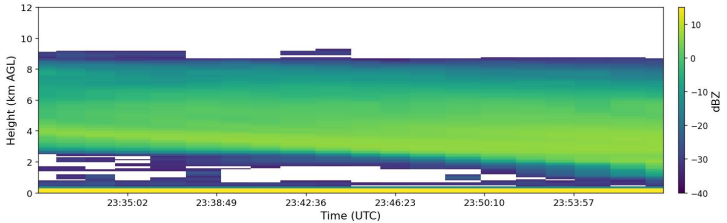


Cloud fraction from AROME-Arctic

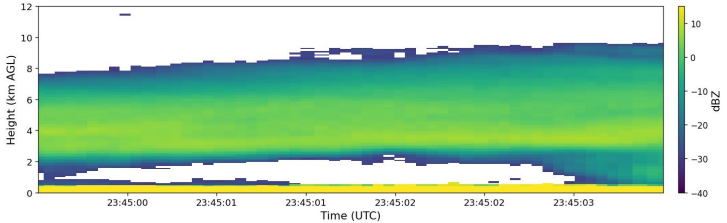


EarthCARE validation products

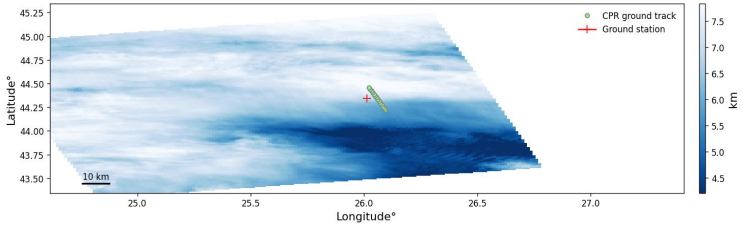
Simulated radar reflectivity from MIRA-35



Radar reflectivity from EarthCARE CPR

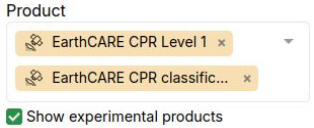


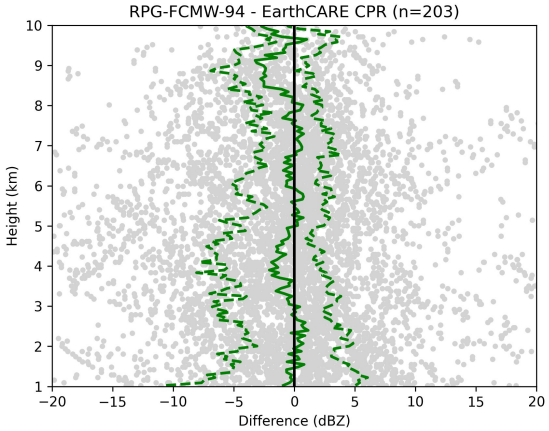
EarthCARE MSI cloud top height



https://cloudnet.fmi.fi/file/5c5995af-6be8-41c1-9a76-a5e3bf772f6e

➔ Experimental simulation, overpass and comparison products (CPR_NOM_1B, CPR_TC__2A) are available in the portal:





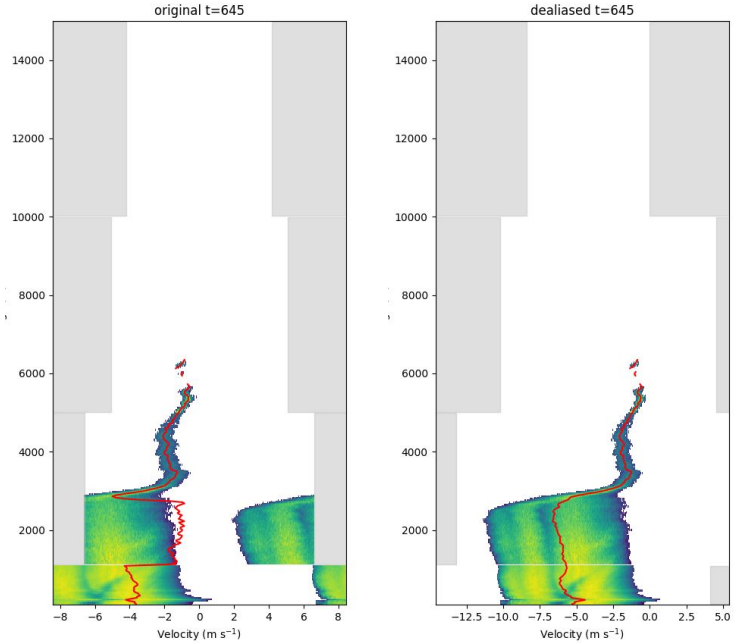
Spectral processing

Processing spectral data from RPG LV0 files not yet in production:

➔ Reproduction of moment and polarimetric calculations to match RPG LV1 files (mostly understood)

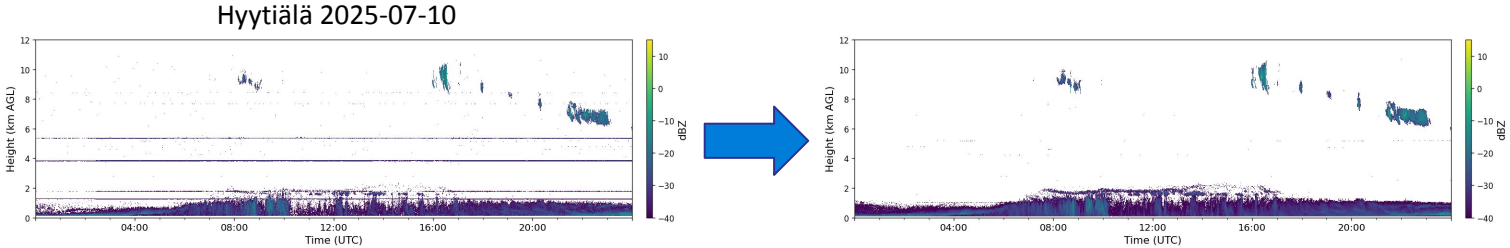
➔ Velocity unfolding/dealiasing (developing and testing methods)

Spectral data from MIRA and BASTA radars in the future?



Small stuff

- **atmoslib** python library
- Schneefernerhaus MIRA and model height problems fixed
- Rain attenuation based on ITU-R P.838-3
- CloudnetPy CLI improvements
- Improved insect detection using SLDR
- Improved RPG stripe filtering (prevalent in few sites)



About publications

- **Important metrics at FMI**
  - Cloudnet is continuously expanding, increasing overall workload
  - Limited time available for first-author publications
  - We highly value and appreciate all collaborative papers with the community

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Thank you !