



# ESA-JAXA Pre-Launch EarthCARE Science and Validation Workshop

13 – 17 November 2023 | ESA-ESRIN, Frascati (Rome), Italy

## EVID14: Cabauw Experimental Site for Atmospheric Research for EarthCARE evaluation (CECARE)

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1. KNMI 2. TU-Delft 3. TNO





# EVID14: CECARE Goals



CECARE focuses on assessment of the validation and representativity of EarthCARE observations of aerosol and cloud products using comprehensive observations at the Cabauw Experimental Site for Atmospheric Research (CESAR) in the Netherlands.

The proposed work aims at the **long-term validation** of the EarthCARE L2 data products and will look into the overall EarthCARE mission goals through building a long-term collocated database from the CESAR Observatory. The unique combination of profiling, column integrated and in-situ

observations carried out at CESAR make the dataset particularly suited for studying the mission goals of EarthCARE, i.e. study of the Earth's radiation balance by studying radiation, radiative forcing (direct, indirect) and feedbacks.

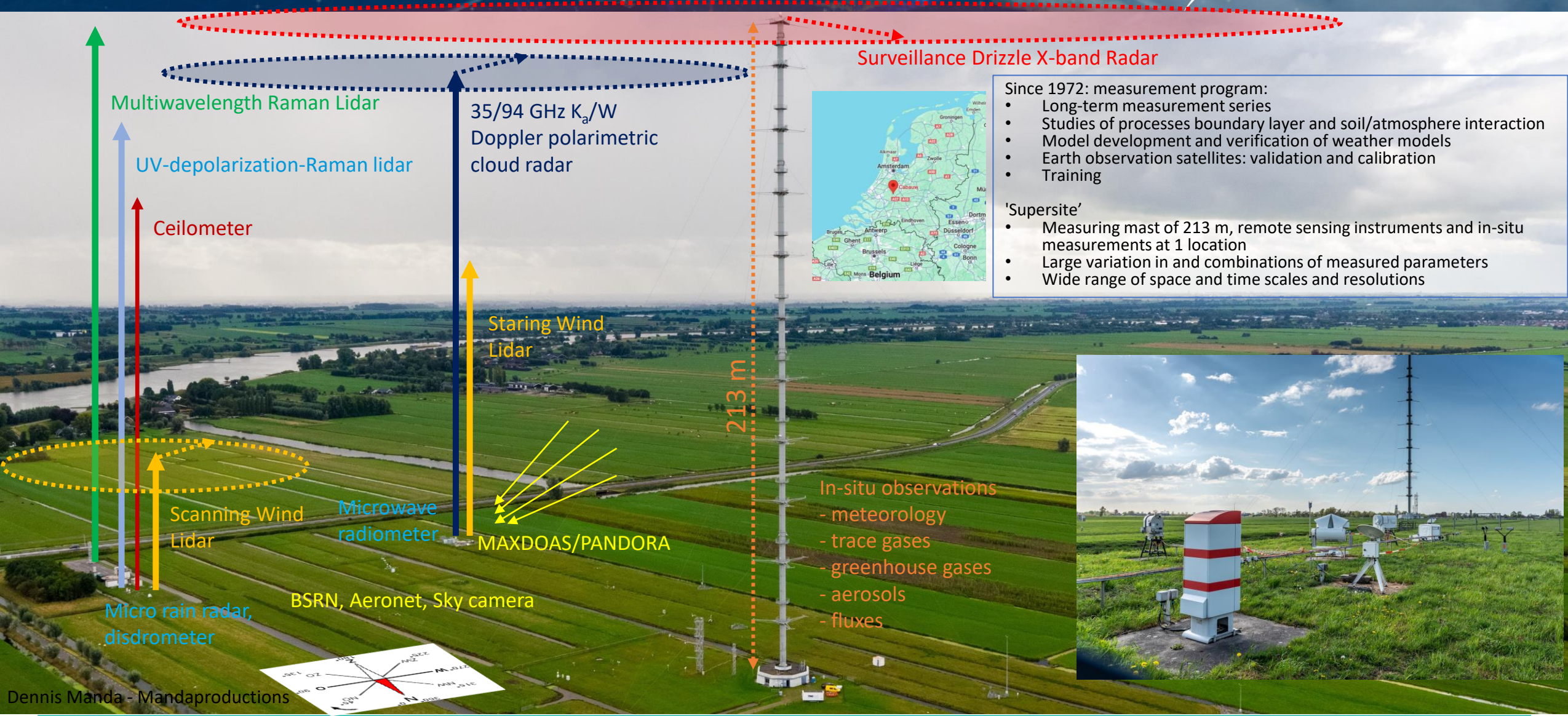


National component of EVID05 (ACTRIS), participating in the ATMO-ACCESS pilot project for satellite CAL/VAL, part of CERTAINTY





# Cabauw Atmospheric Research Station





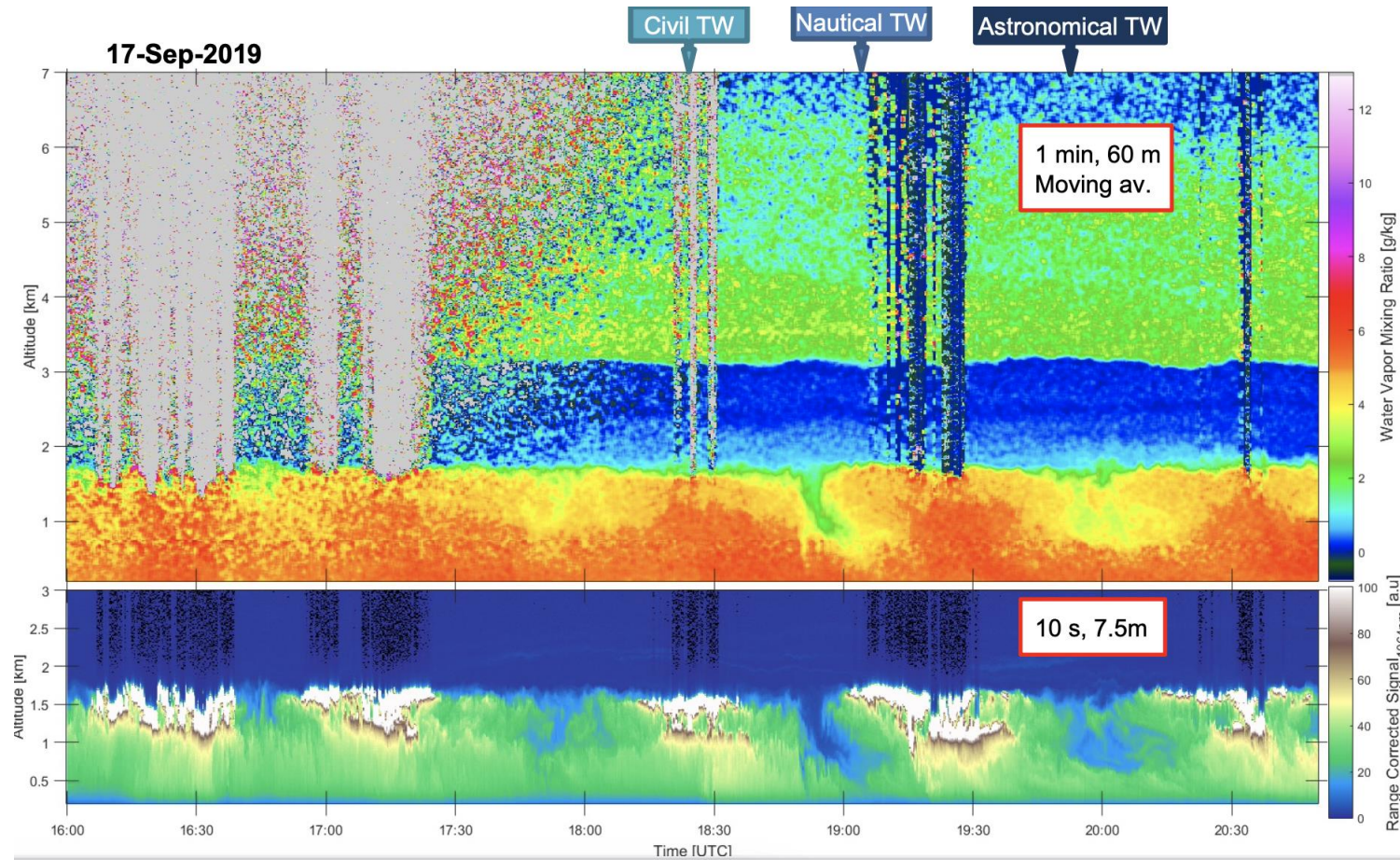
$$C\text{ÆLI: } 3\beta + 2\alpha + 1\delta + \alpha$$



- Cabauw ACTRIS/Earlinet lidar
- 355, 387, 407, 530, 532, 532p, 532s, 607, 1064 nm
- Near field, far field and depolarisation telescopes – 24 channels
- Raman daytime capabilities ( $\alpha$ ,  $\beta$  at UV)



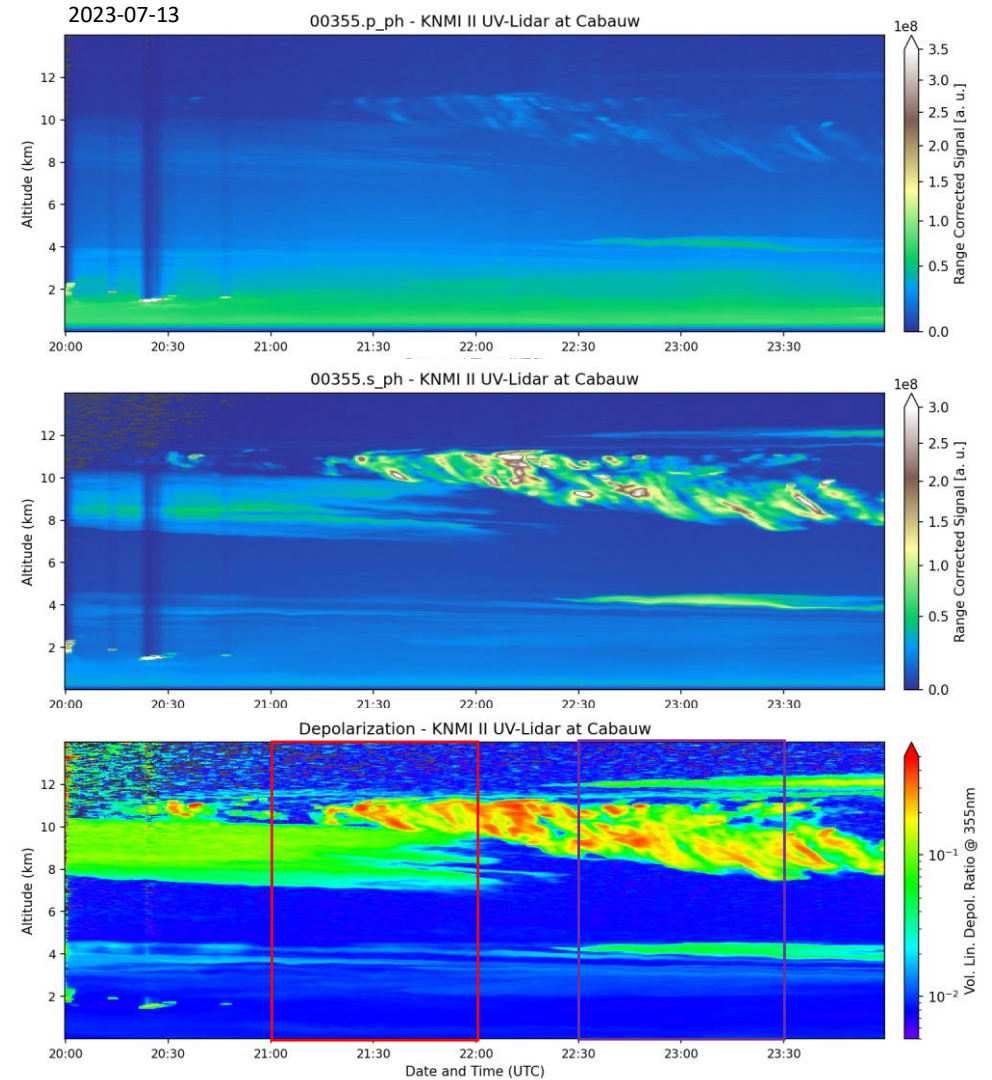
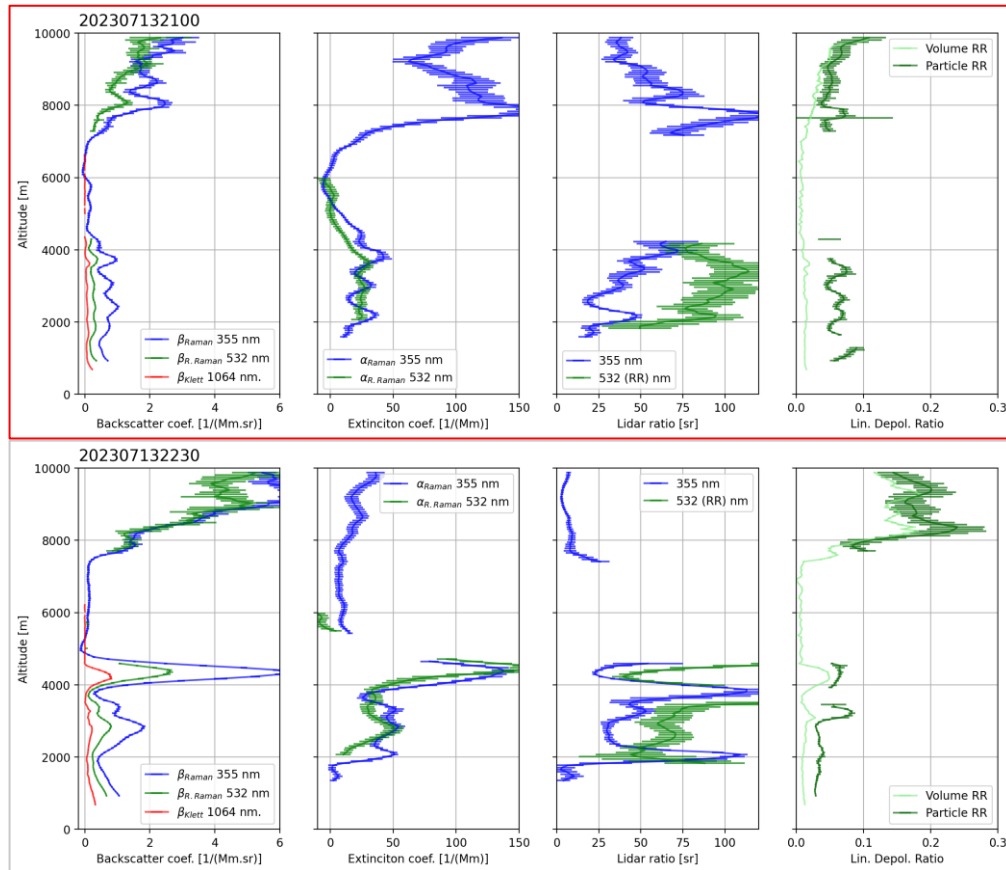
Water Vapor Mixing Ratio



*Aerosol optical properties predicted from ground-based observations compared to Raman lidar retrievals during RITA-2021, Xinya Liu, Diego Alves Gouveia, Bas Henzing, Arnoud Apituley, Arjan Hensen, Danielle van Dinther, Rujin Huang, and Ulrike Dusek, ACP, initial submission, 5 Oct. 2023*



- Caeli:  $3\beta + 2\alpha + \delta_{532}$  above  $\sim 800$  m
- UV-lidar:  $\beta_{355}$ ,  $\alpha_{355}$ ,  $\delta_{355}$  above  $\sim 300$  m (24/7)
- Mind the gap: Depolarization at UV and VIS, but from different instruments





**Cloudnet DATA PORTAL** Search data Visualise data Measurement sites Documentation

Visualisations for 13 November 2023 comparison view

Cabauw CHM 15k ceilometer  Volatile Cabauw HATPRO microwave radiometer  Volatile

Attenuated backscatter coefficient

Liquid water path

Non-screened attenuated backscatter coefficient

Integrated water vapour

Cabauw HATPRO microwave radiometer  Volatile Cabauw RPG-FMCW-94 cloud radar  Volatile

Liquid water path

Radar reflectivity factor

Integrated water vapour

Doppler velocity

Location: Cabauw

Show all sites

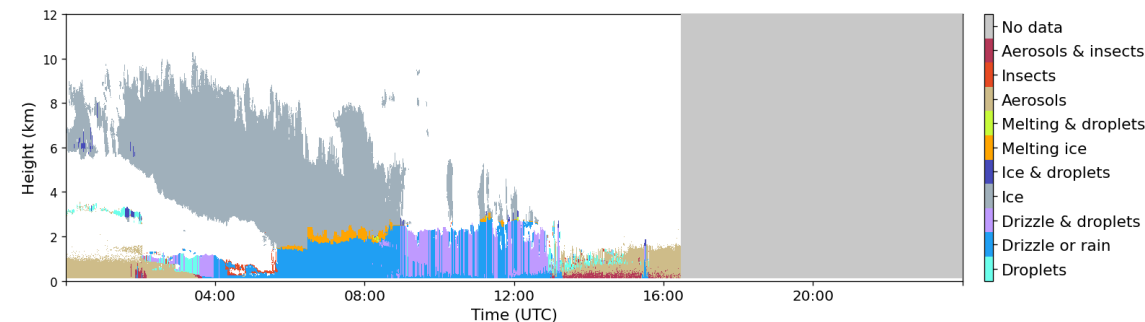
Date: 2023-11-13

Product: Select

Show experimental products

Instrument: Select

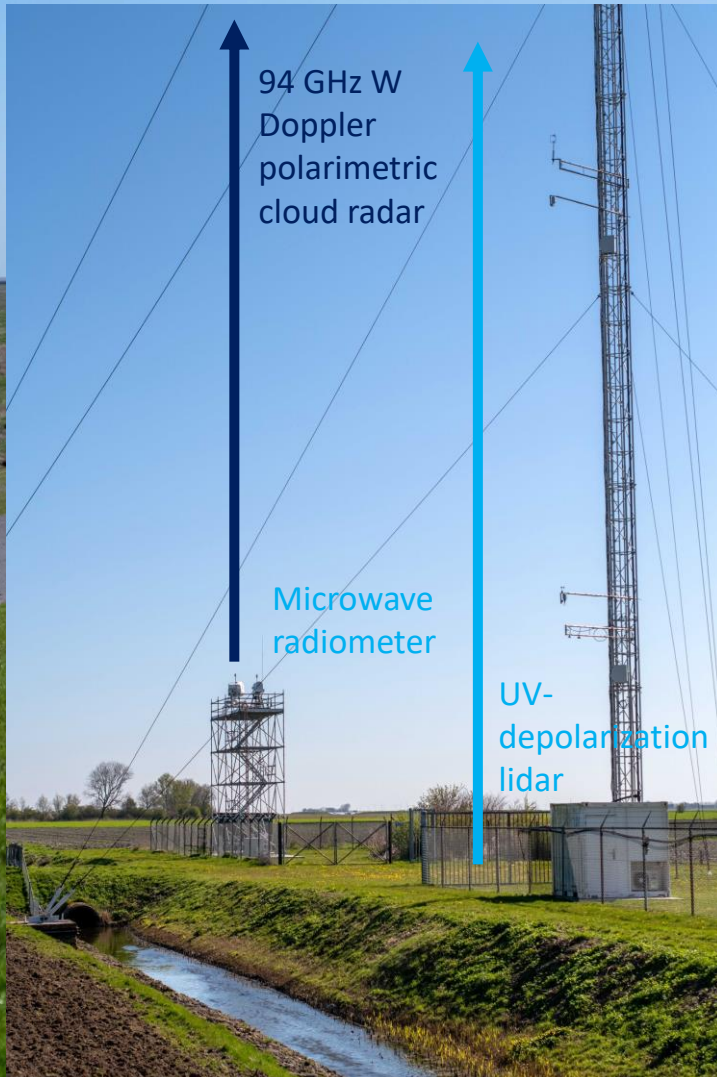
Variable: Select



<https://cloudnet.fmi.fi/search/visualizations?site=cabauw>



# Lutjewad Atmospheric Research Station





# Cloudnet – Lutjewad



Cloudnet DATA PORTAL Search data Visualise data Measurement sites Documentation



Location Lutjewad

Show all sites

Date 2023-11-13

Product Select

Show experimental products

Instrument Select

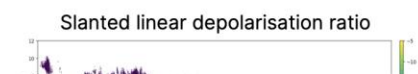
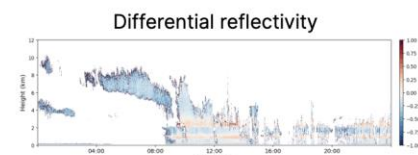
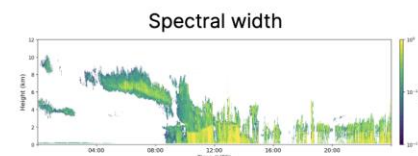
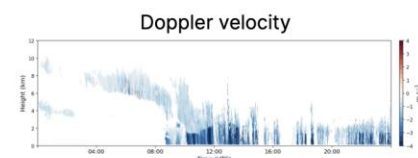
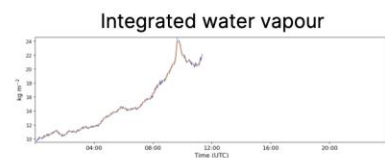
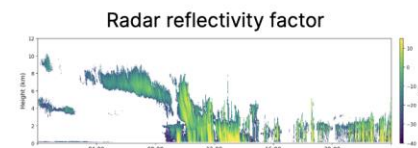
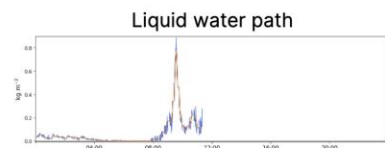
Variable Select

Visualisations for 13 November 2023

comparison view

Lutjewad HATPRO microwave radiometer  Volatile

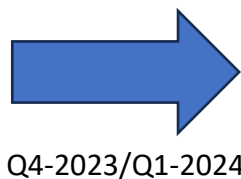
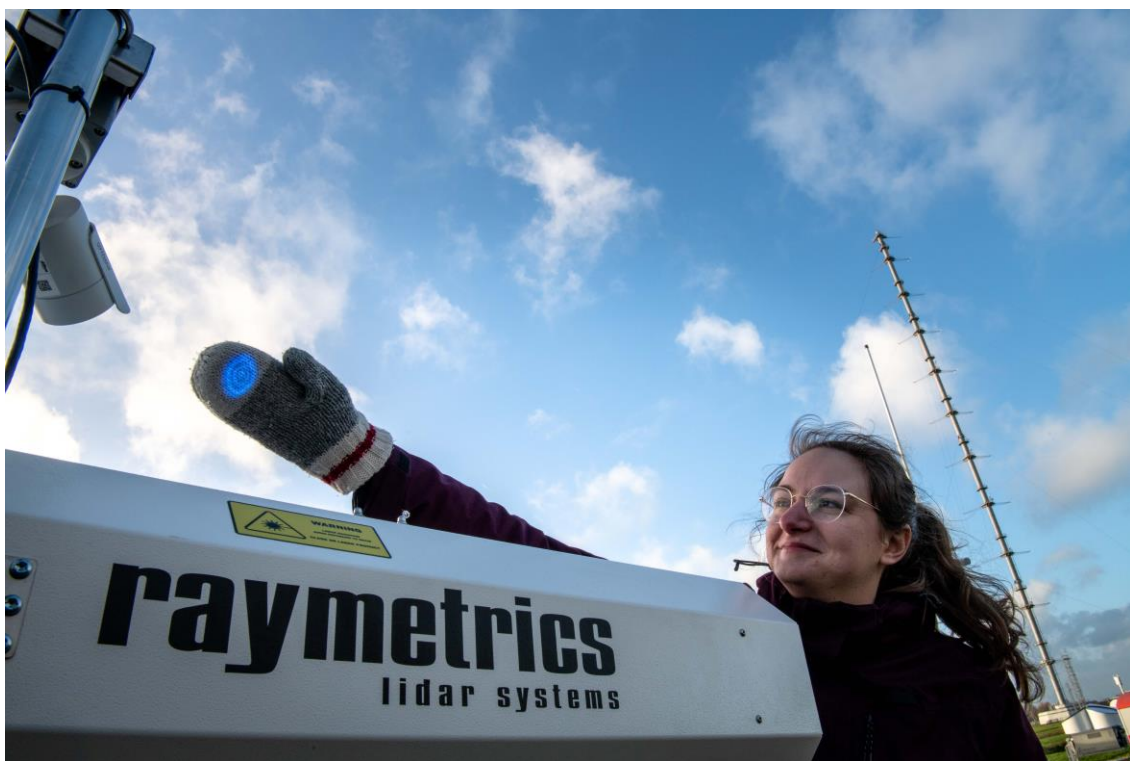
Lutjewad RPG-FMCW-94 cloud radar  Volatile



<https://cloudnet.fmi.fi/search/visualizations?site=lutjewad>



# Second UV-lidar to Lutjewad



Q4-2023/Q1-2024





# CINDI-3 announcement

Location : Cabauw, The Netherlands  
Preparation phase. : 21 May – 26 May 2024  
Observation phase. : 27 May – 16 June 2024,  
possible extension until 21 June

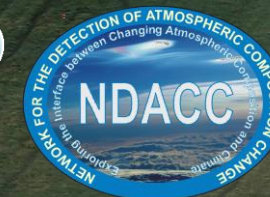
## Goals:

- Intercomparison
- Main target gases: NO<sub>2</sub>, Ozone
- Profile information
- Homogeneity (configuration with temporary stations in the urban Rotterdam area)
- Mobile observations in the urban area (ground based and airborne)

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Environment*







Martijn.van.Dijk, 2023 Cabauw paraglider