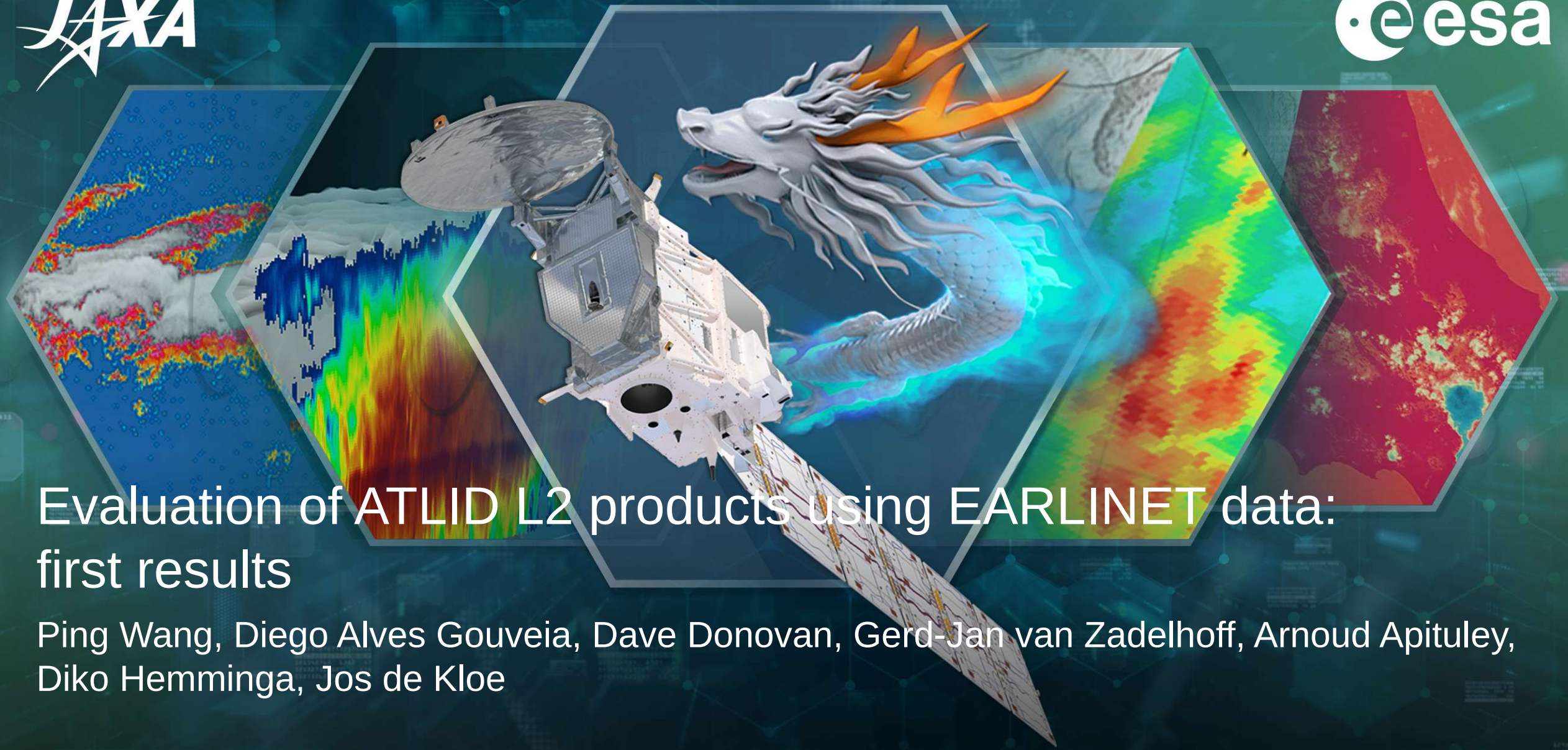


# Evaluation of ATLID L2 products using EARLINET data: first results

Ping Wang, Diego Alves Gouveia, Dave Donovan, Gerd-Jan van Zadelhoff, Arnoud Apituley, Diko Hemminga, Jos de Kloe

KNMI, NL

1st ESA-JAXA EarthCARE In-Orbit Validation Workshop
14 – 17 January 2025 | VIRTUAL EVENT

# Data and method

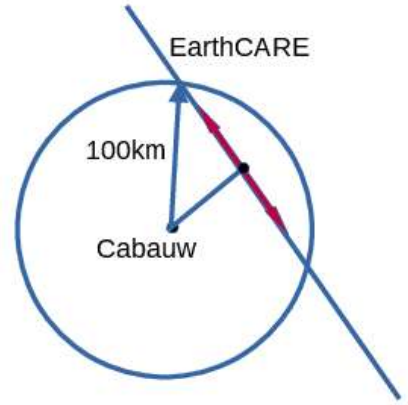
Products
ECA_EXAA
- ATL_AER_2A
- ATL_EBD_2A

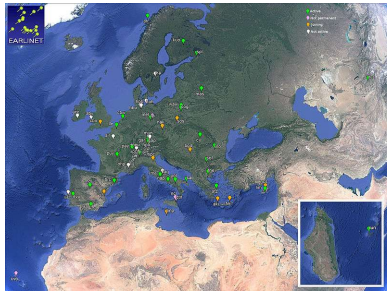
Extinction coefficent
Backscatter coefficient
Lidar ratio
Depolarization ratio

EARLINET products at 355 nm from EVDC

https://www.earlinet.org/
https://evdc.esa.int/

Collocation:
1) Distance < 100 km (radius and cord), time difference < 1.5 hour.
2) ATL single measurement + 100 km average
3) EARLINET 1 hour averaged data, processed using SCC

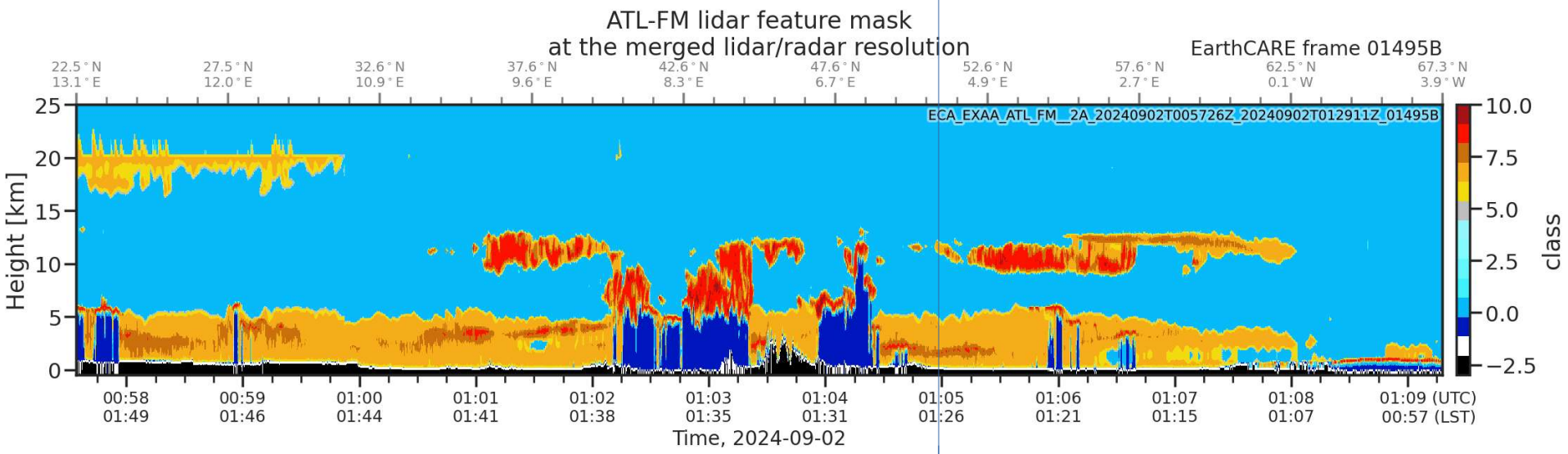


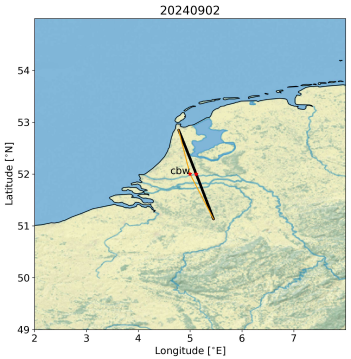



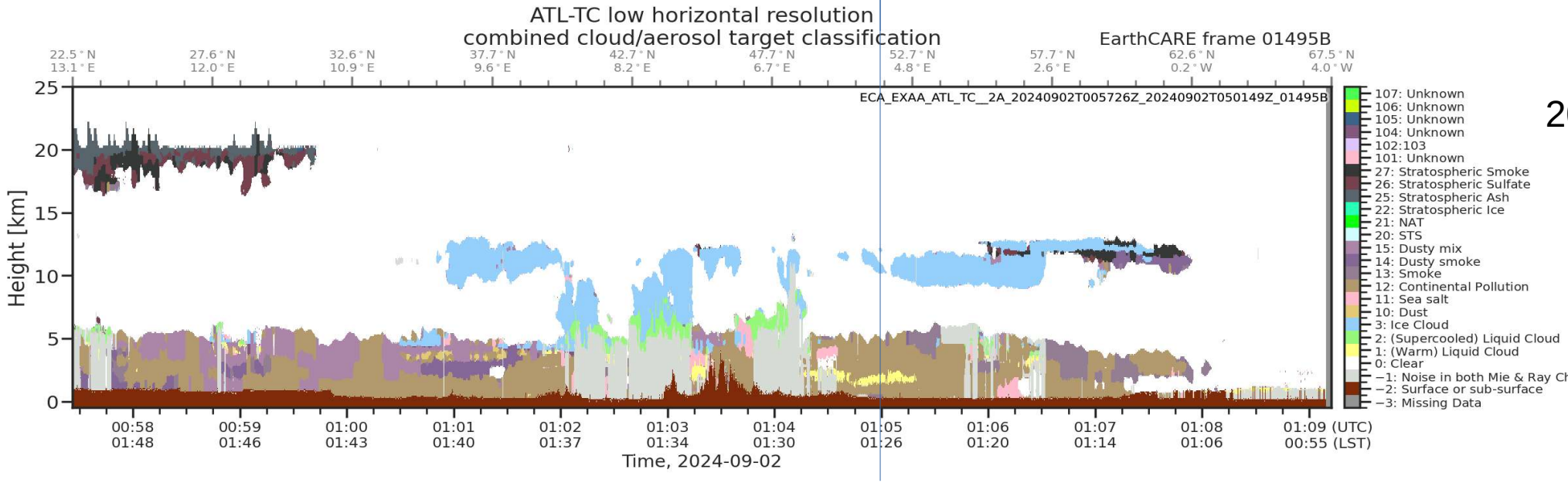
Data quality control:
quality_status in AER, EBD = 0, 1
classification in AER >= 10
EARLINET, remove filled values and unrealistic values (too large errors).

# 20240902 Frame 01495B feature mask

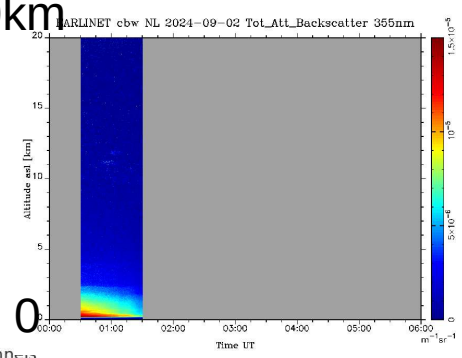
Overpass at 01:05 UTC
at Cabauw
Night time frame



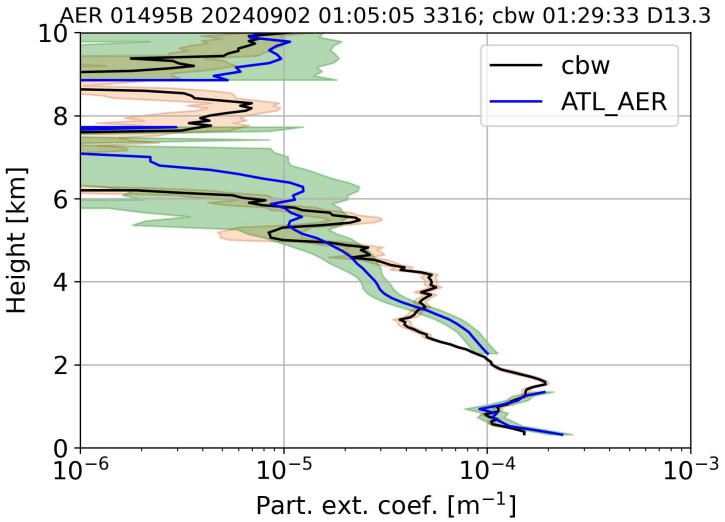



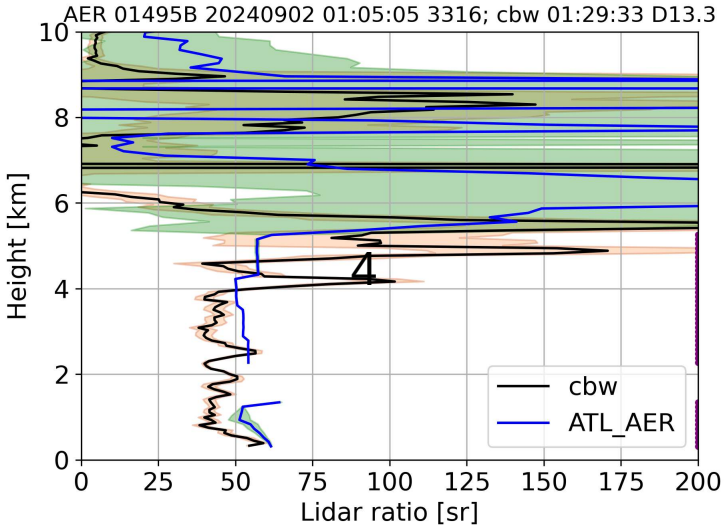



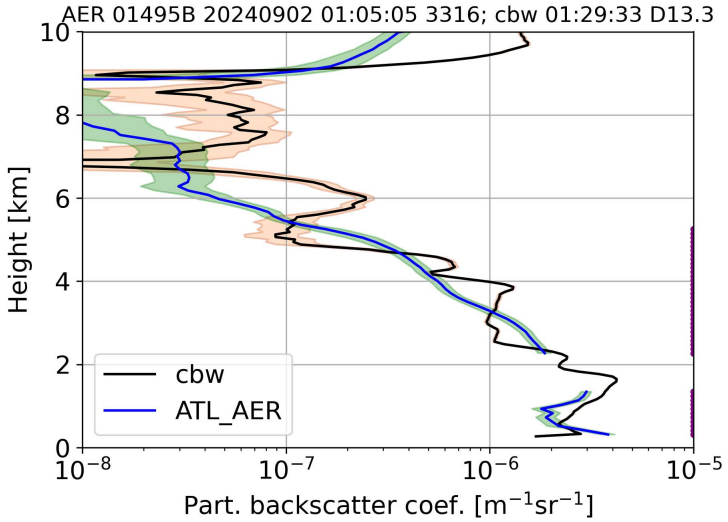

20km

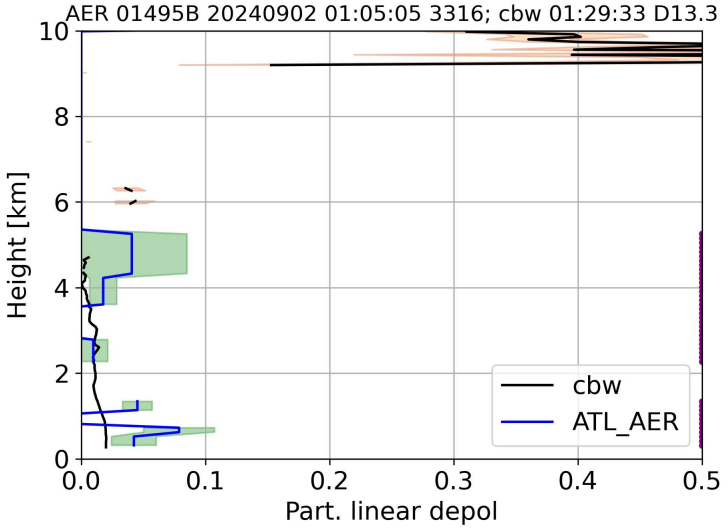


# 20240902 frame 01495B  AER at Cabauw  (cbw)




Single closest ATL_AER profile averaged for low signals in retrieval already

Cabauw: black+orange
ATL: blue+green

Good agreement for aerosols.

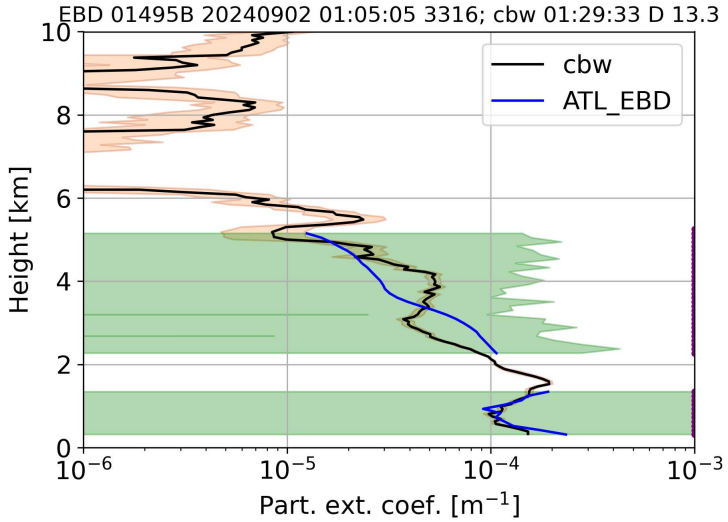
Data are not plotted above 10 km because of no aerosols.

Closest distance  13.3 km

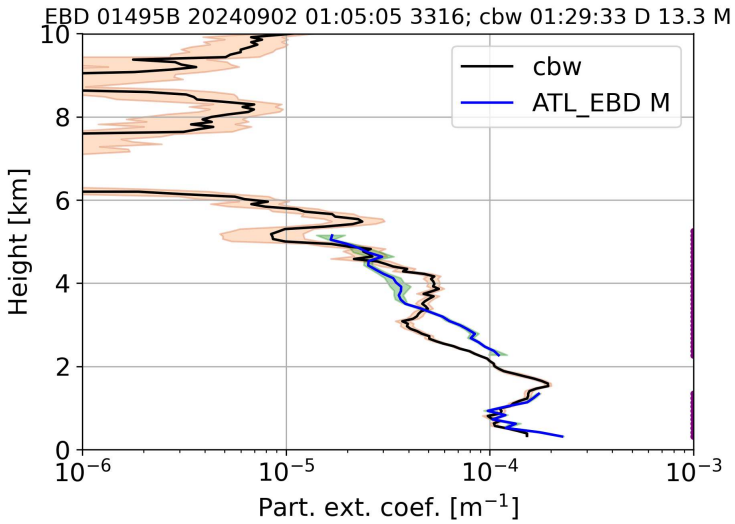
# 20240902 01495B EBD extinction coefficient at Cabauw

single

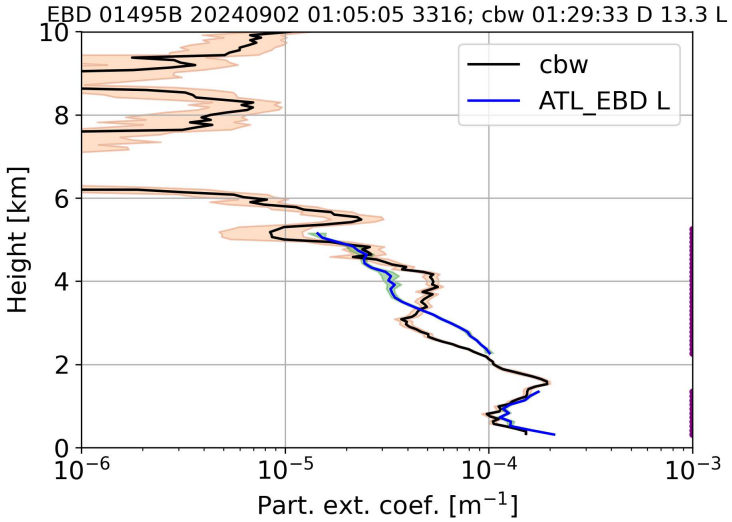
## EBD high resolution 1 km



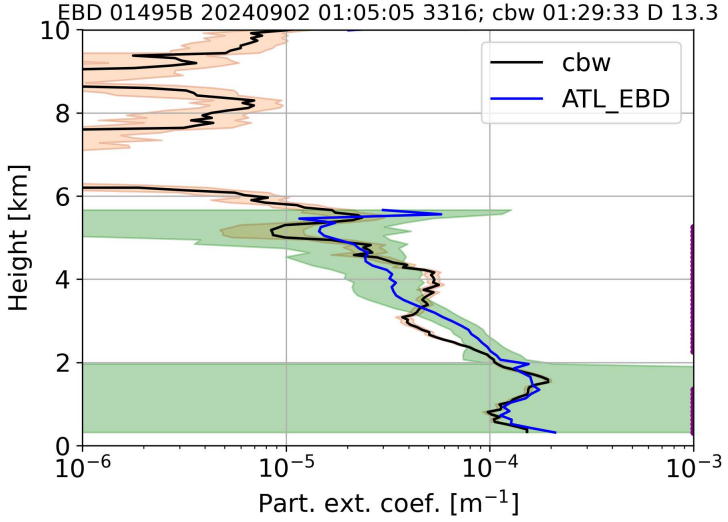

## EBD medium resolution 50 km

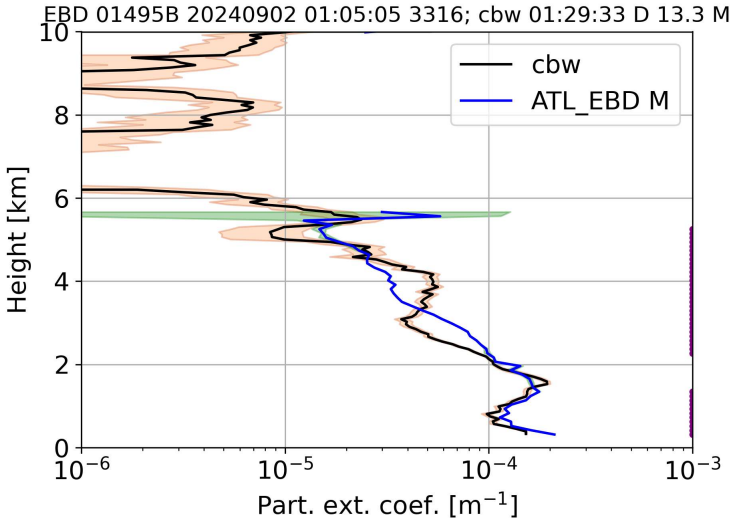


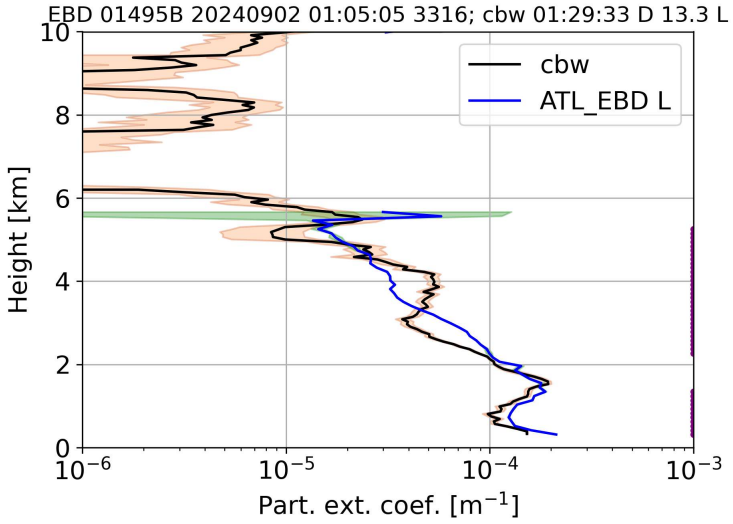

## EBD low resolution 100 km




mean



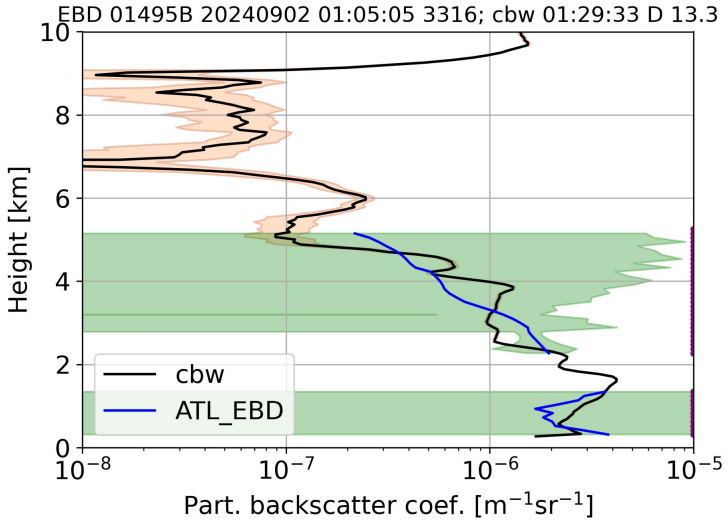



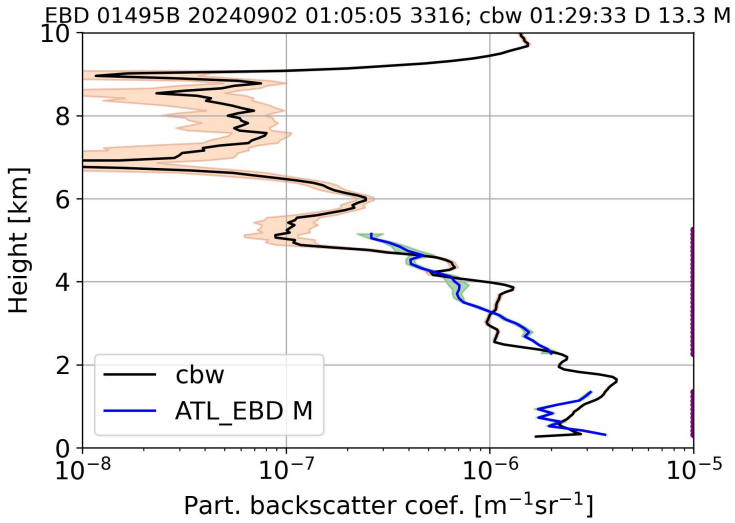
# 20240902 01495B EBD backscatter coefficient at Cabauw

single

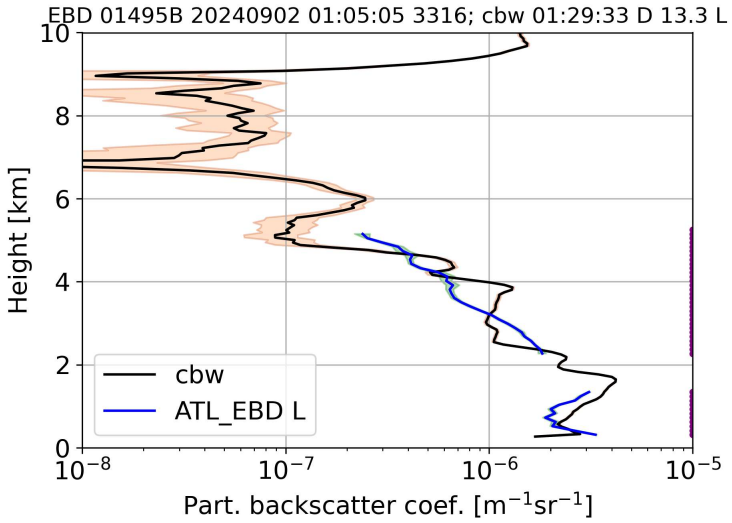
## EBD High resolution 1 km



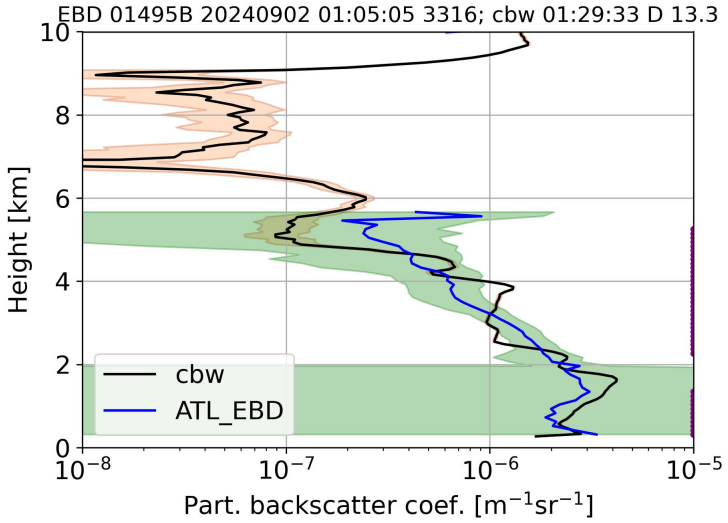

## EBD Medium resolution 50 km

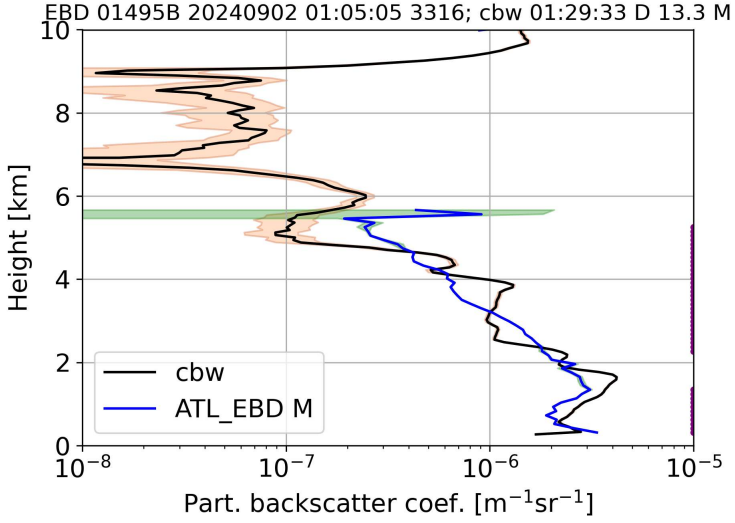


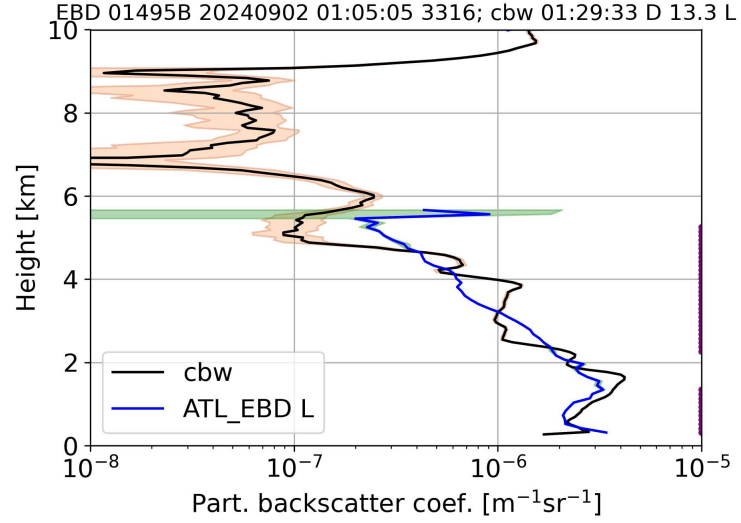

## EBD low res 100 km




mean



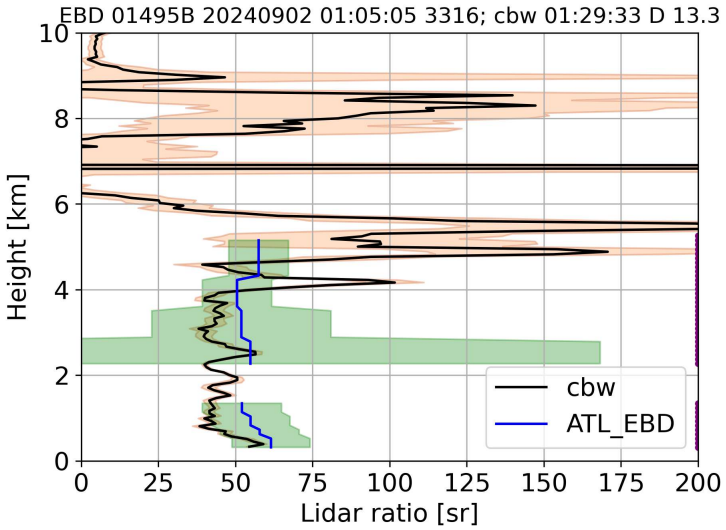



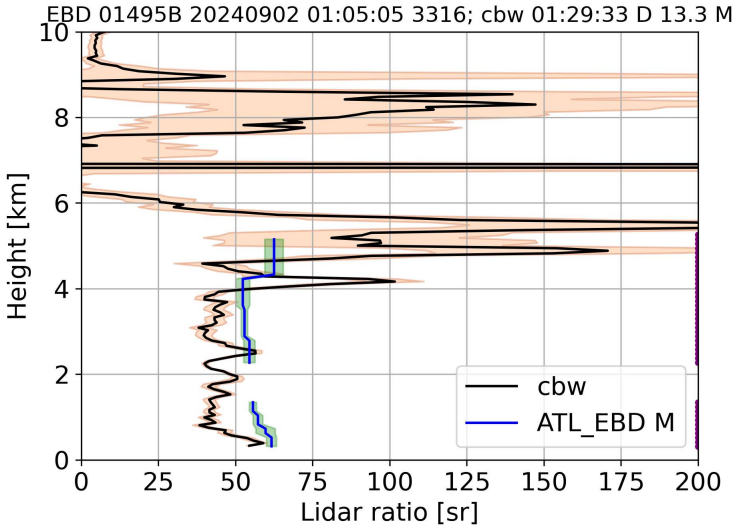
# 20240902 01495B EBD lidar ratio at Cabauw

single

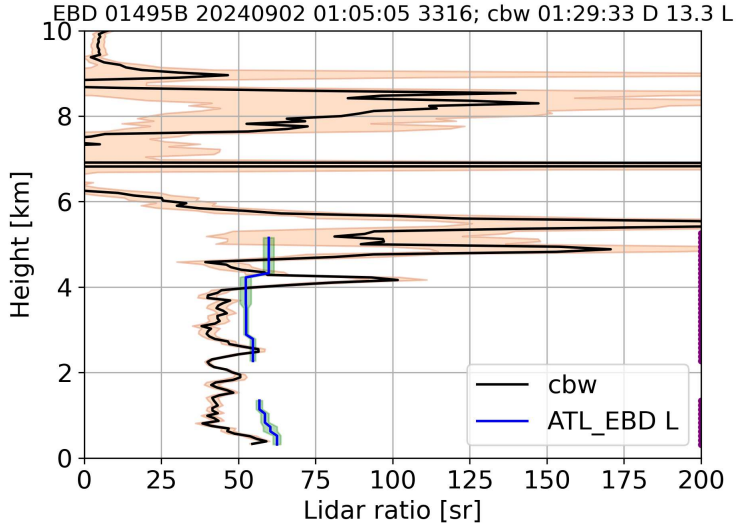
## EBD high res 1 km



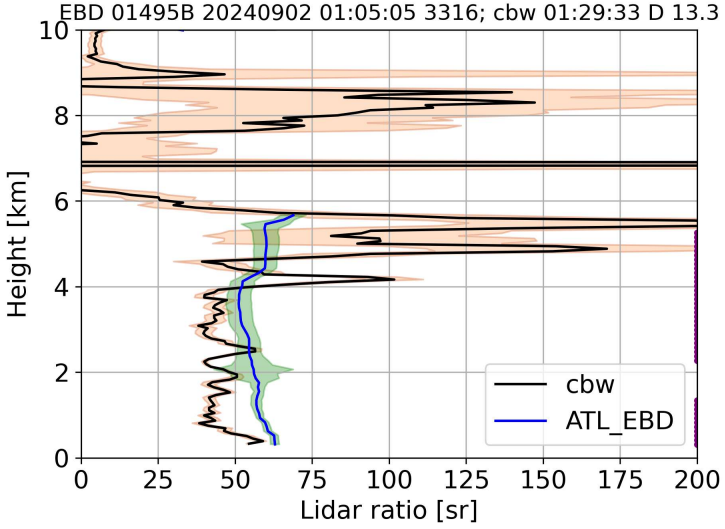

## EBD medium res 50 km

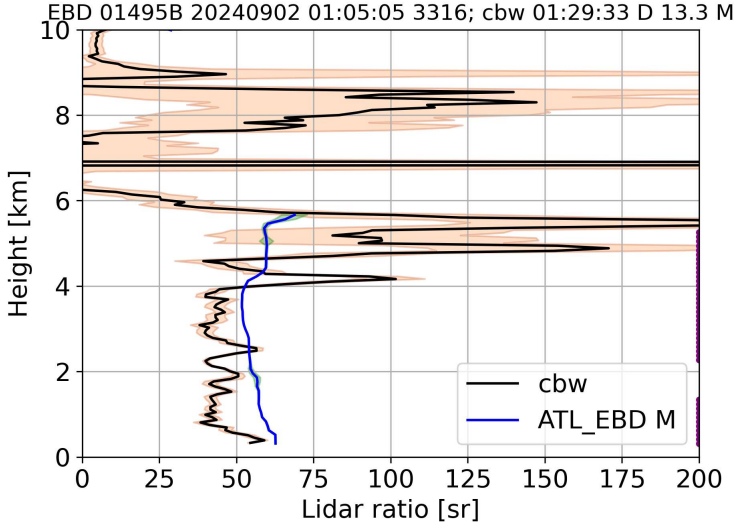


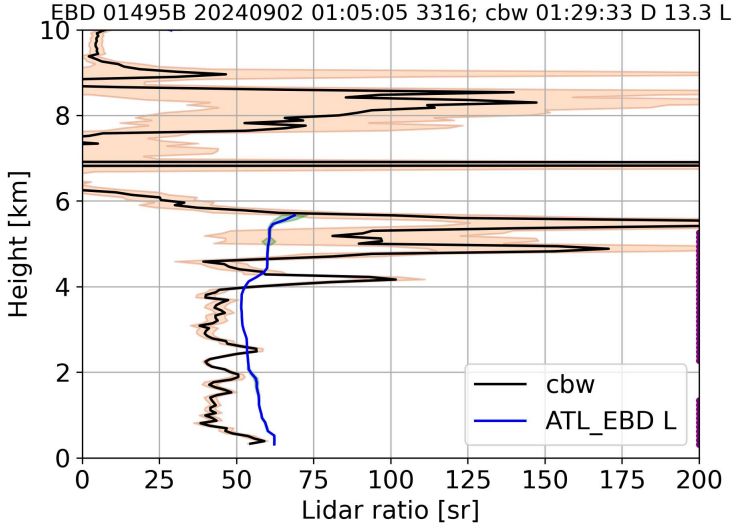

## EBD low res 100 km




mean



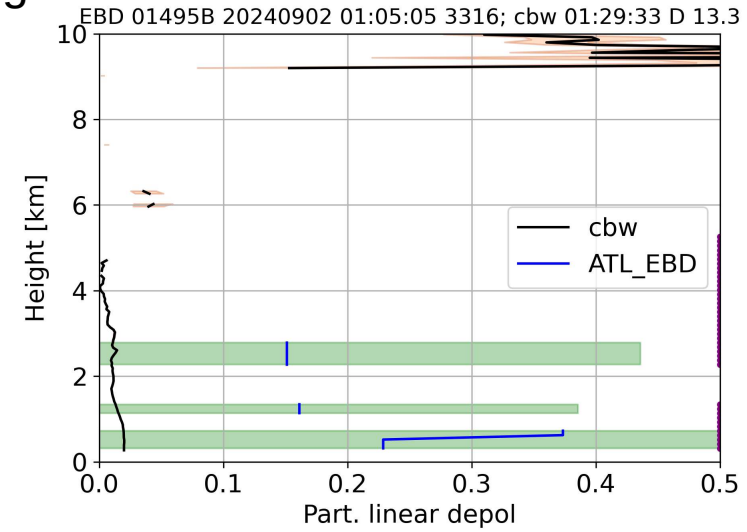



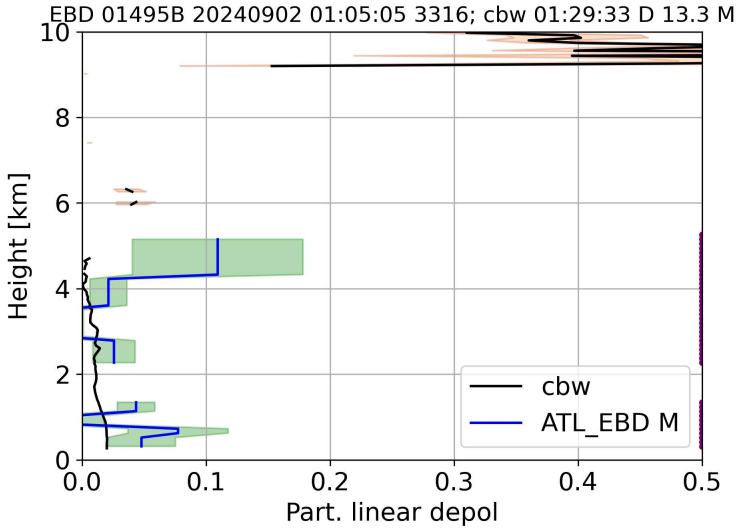
# 20240902 01495B EBD depolarization ratio at cbw

single

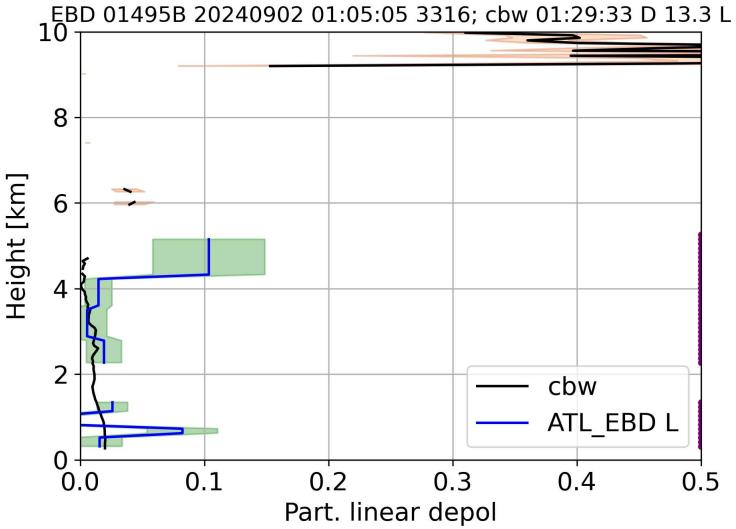
## EBD High resolution 1km



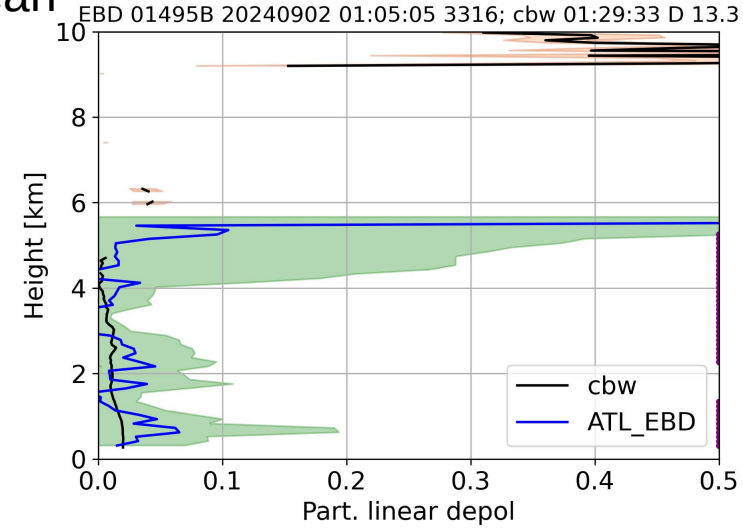

## EBD medium resolution 50 km

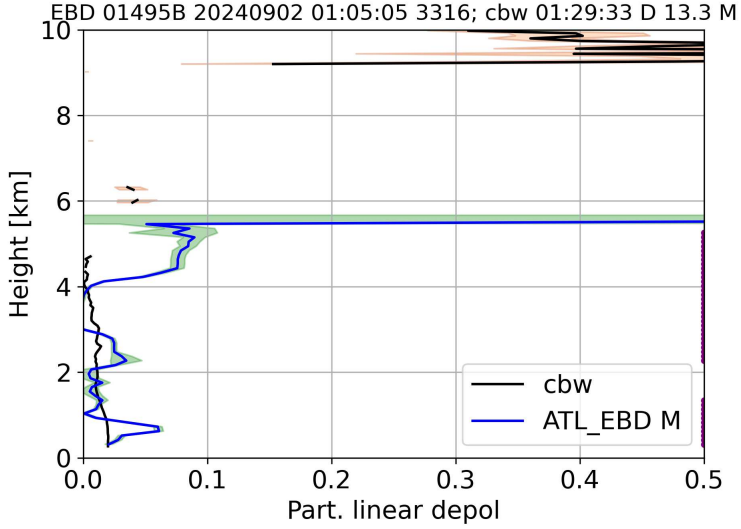


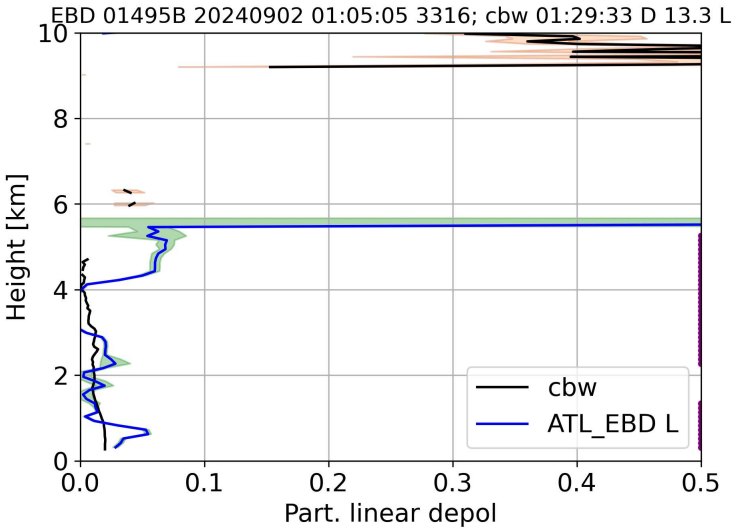

## EBD Low resolution 100 km



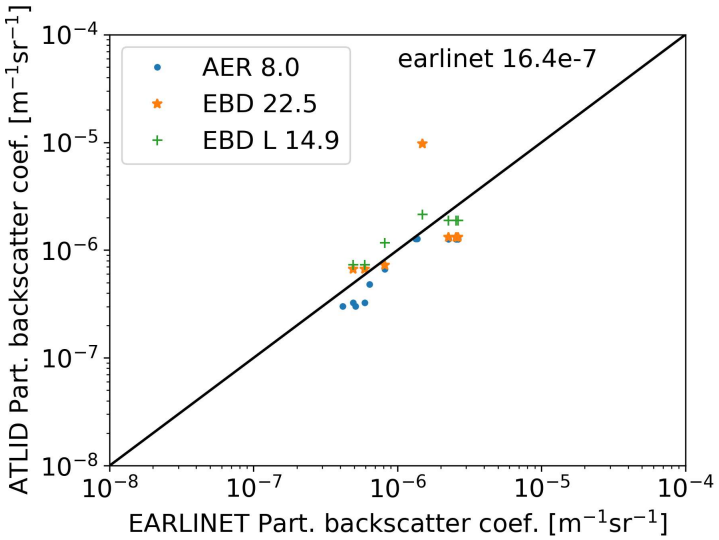

mean

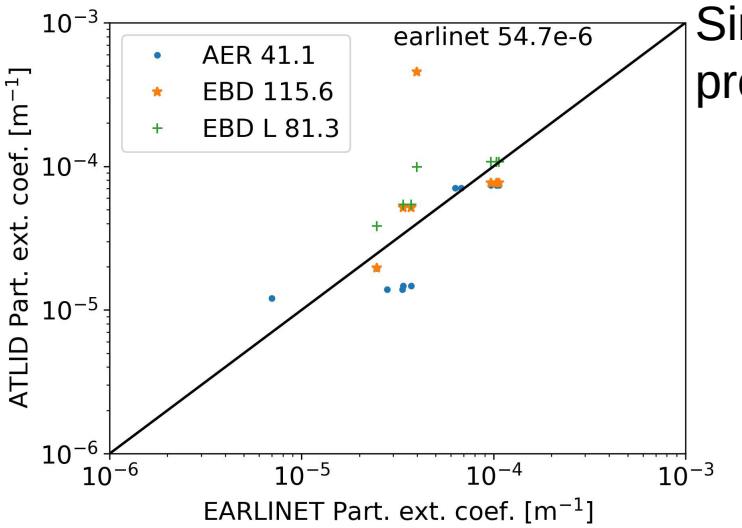


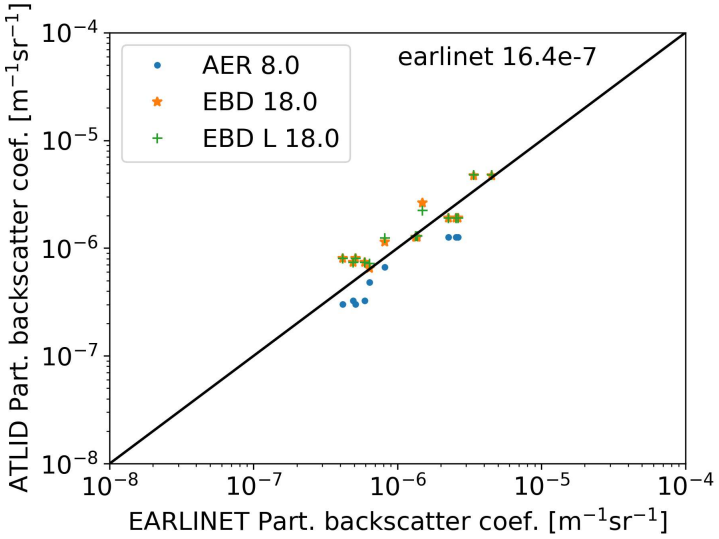



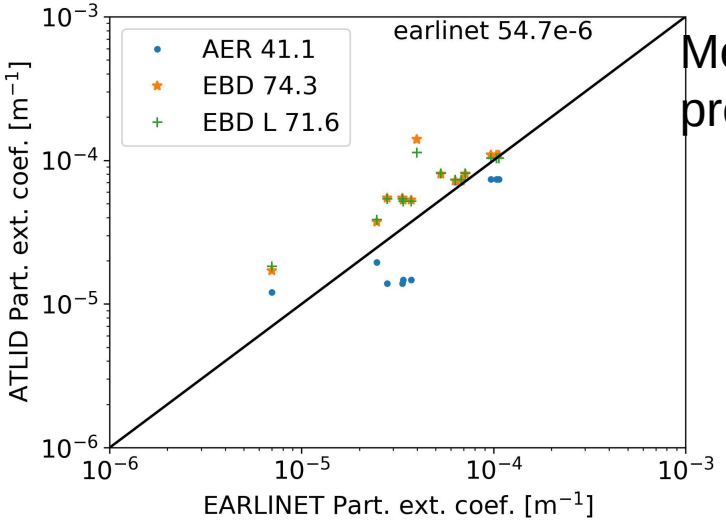
# Statistics of collocated aerosol cases at Cabauw in 202408 – 202410




Single EBD profile




Mean EBD profile

14 collocated profiles in 7 days, all night time data

Mean values for backscatter (x1e-7) and extinction (x1e-6) are provided after the labels.

The mean EBD high resolution profile is more close to the EARLINET profile

The depolarization ratios are also comparable but only 5 profiles.

# Summaries

- We evaluate the ATLID AER, EBD products using EARLINET ECVT data every day.
- We showed the AER, EBD data at Cabauw from August to October 2024.
- The ATLID FM, AER, EBD products are in good shape, especially the night time orbits.
- The AER product seems having a small negative bias in extinction and backscatter.
- The mean EBD high resolution profiles usually have better agreement with the Cabauw measurements than the single high resolution profile.

- We would like to thank the EVDC team, all EARLINET sites, all PollyNET sites for providing data.