



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

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## EVID 25: Cabauw Lidar observations for ATLID L1 and L2a product evaluation

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# Primary Objectives (as written in 2018)

- ATLID L2a profiles of aerosol/cloud extinction backscatter and depolarization (A-PRO and ACM-CAP)

## Primary Means:

- Use Lidar measurements at Cabauw in the central Netherlands
- 24/7 ground-based 355nm (elastic)depolarization lidar observations
- Multi-wavelength (non-24/7) Raman lidar observations
- Supported by other instruments on site (e.g. BSRN site, cloud radar etc..)



UV lidar



(scanning) Doppler lidar



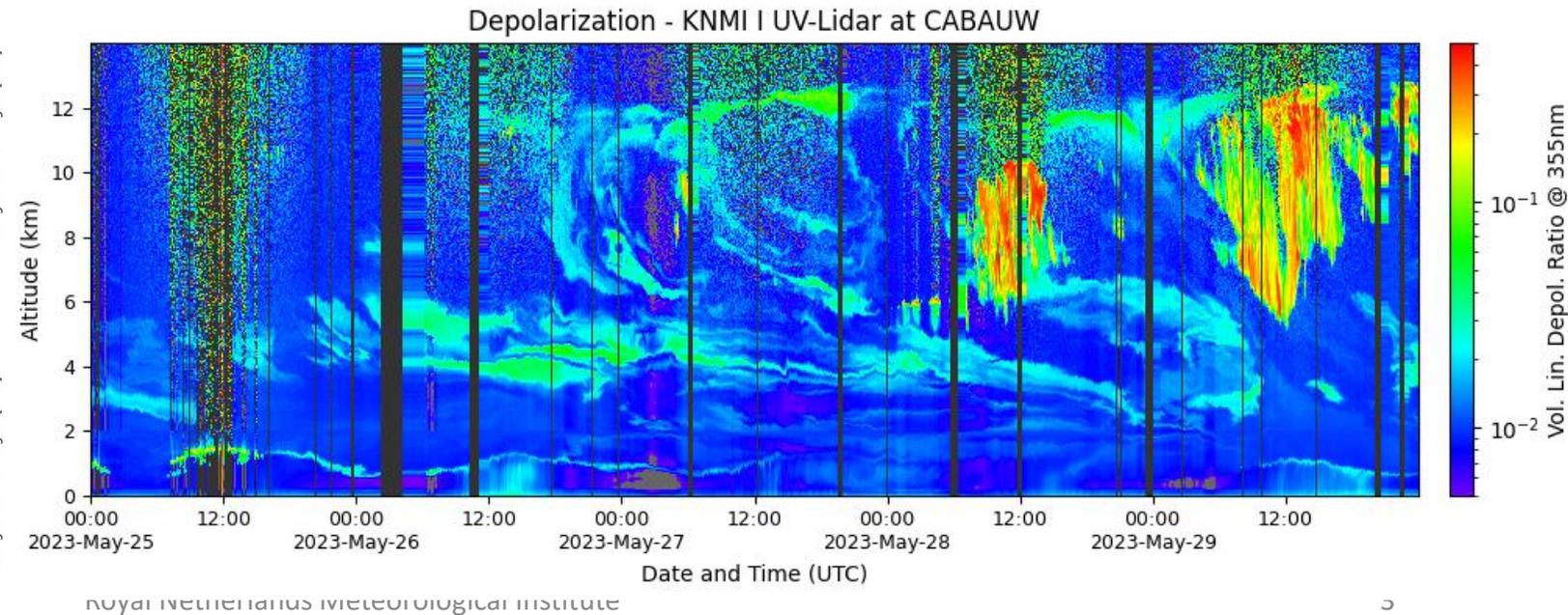
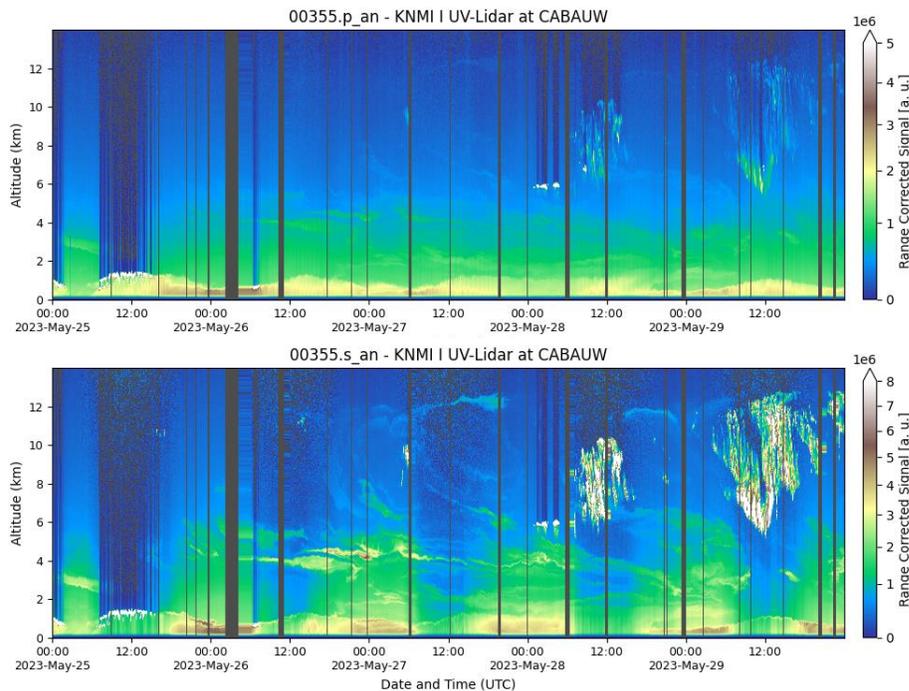
Raman lidar  
(CAELI)



AWS ceilometer

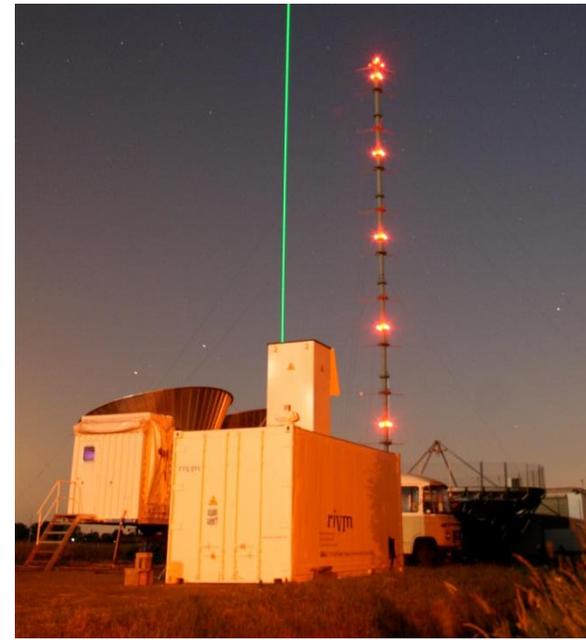
# UV lidar

- Diode-pumped laser - 355 nm, ~30 mJ/pulse, 50 Hz
- 355p, 355s, 387 - AN, PC and Standard Deviation
- Fully ACTRIS/EARLINET compliant (QAQC)
- Full overlap height < 300 m
- 24/7 unattended operation

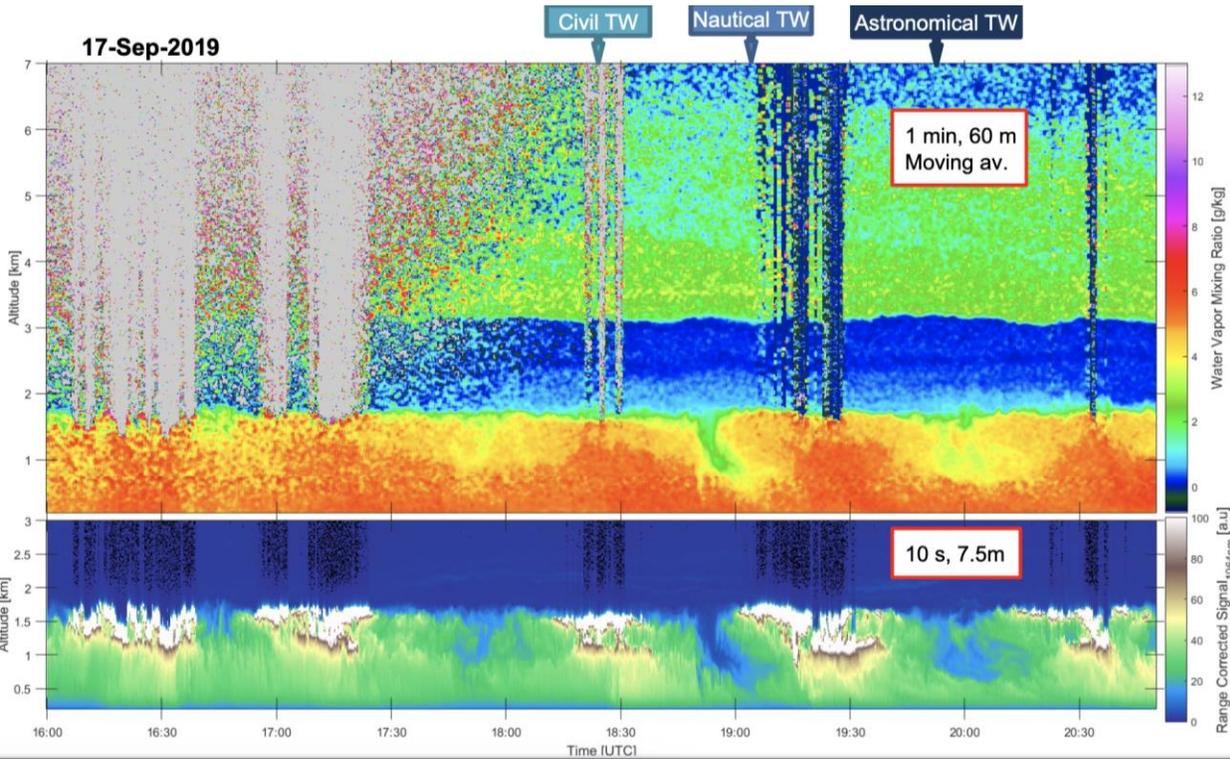


# CÆLI: $3\beta + 2\alpha + 1\delta + \text{H}_2\text{O}$

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

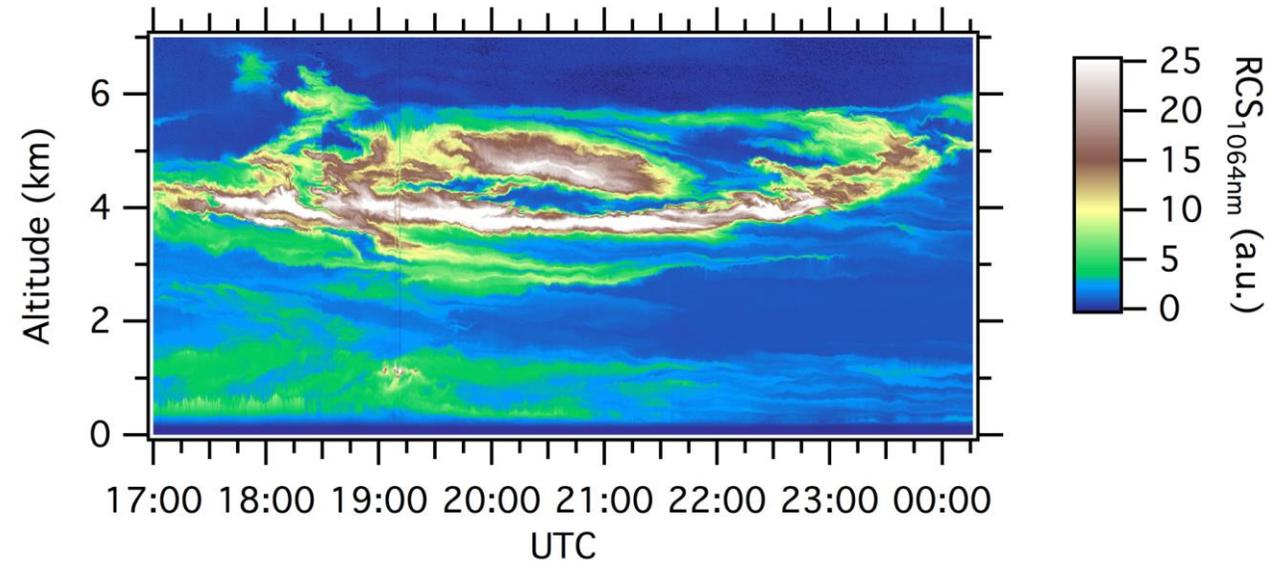


Water Vapor Mixing Ratio



Volcanic Ash

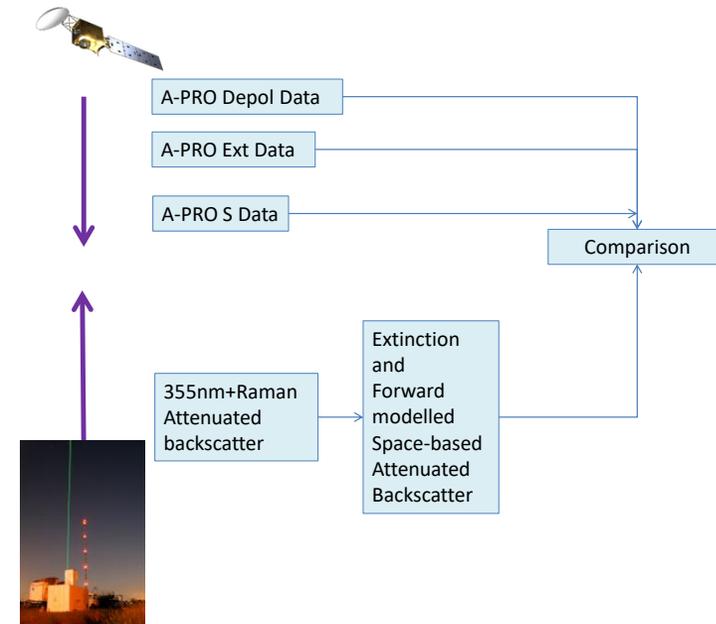
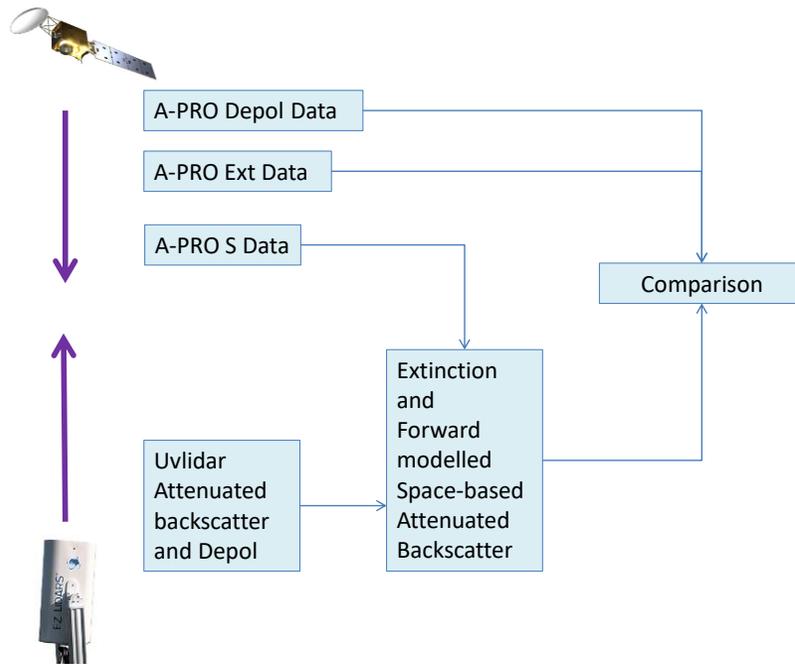
Mon, May 17, 2010, 16:59 – 00:16 UTC



# Original proposal

Direct L2 comparison.

Use lidar observations at Cabauw → Process to L2 → Forward model L1 ATLID → Compare with ATLID L1 !



Medium/long-term activity  
Overpasses within 100-150 km  
Preliminary results will be reported



## What has changed ?

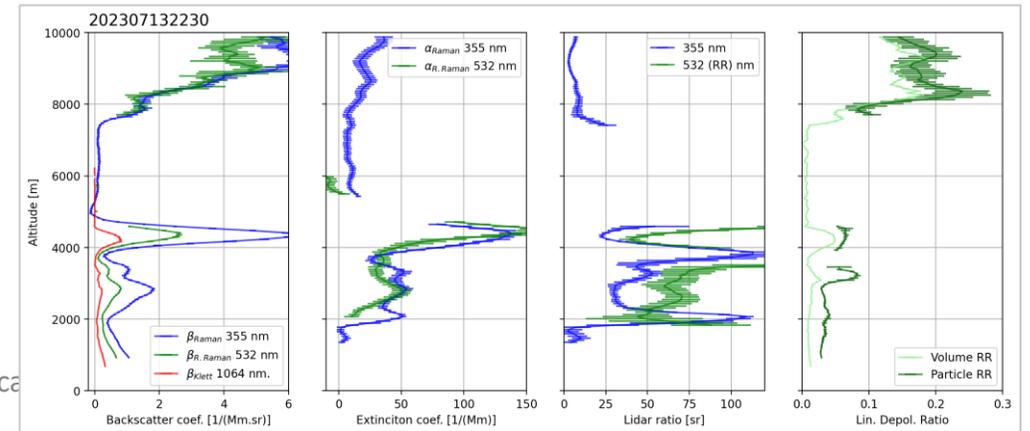
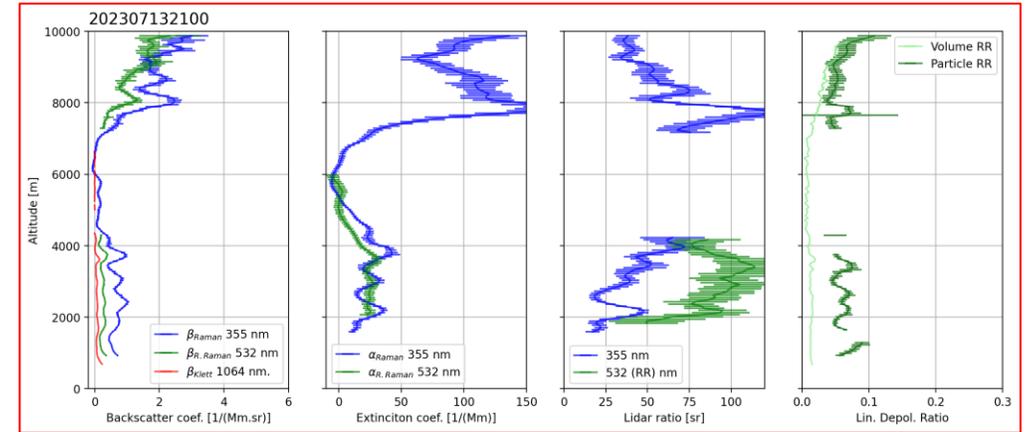
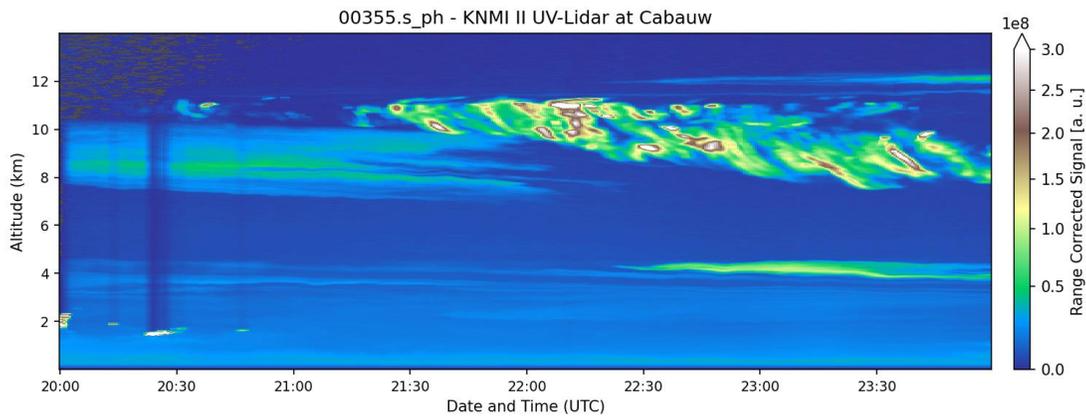
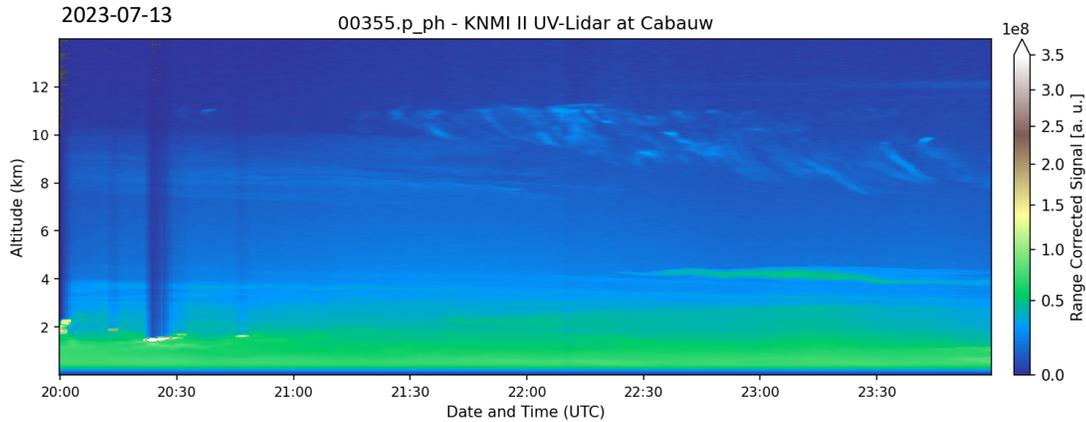
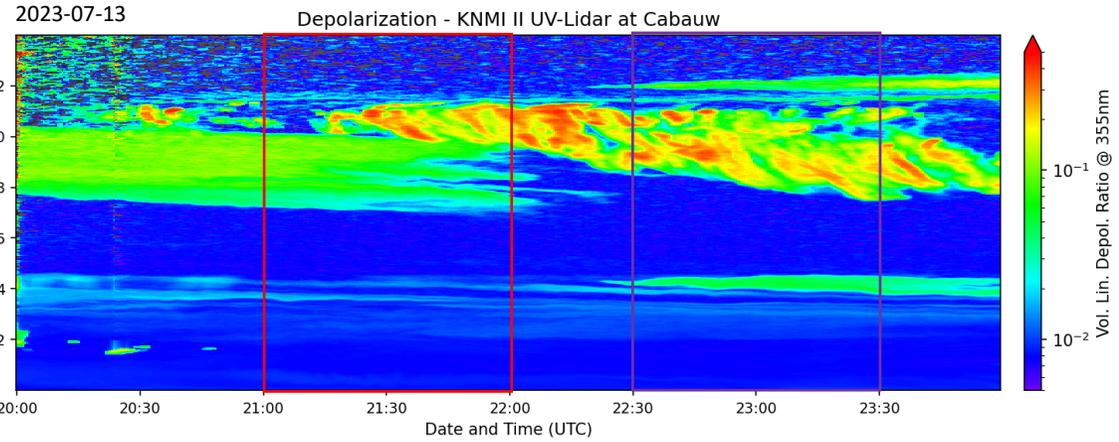
- Cabauw UVlidar (Leosphere) has been decommissioned !
  - But new 24/7 355 nm Raymetrics lidar (with Raman channel) is coming on-line !
- Several attempts to obtain specific Cal/Val projects were not successful...
  - But recent EU project (e.g. CERTANITY) contains funding that could contribute !
- Ground L2 → Space L1 simulator tool development has been funded by ESA through CARDINAL and has evolved into the development of a community tool!
- Cabauw lidar data will be processed via ACTRIS .
  
- So..
  - Cabauw will contribute !
    - But maybe this specific formal Cal/Val proposal should be merged (subsumed) within the wider **Cabauw activities for EarthCARE evaluation (CECARE)** umbrella ?
      - (see next talk by A. Apitulay)



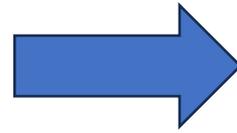
BACKUP Slides

# SCC retrievals: Caeli + UV-lidar

- 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



# Second UV-Lidar @ Lutjewad station



By the end of 2023

