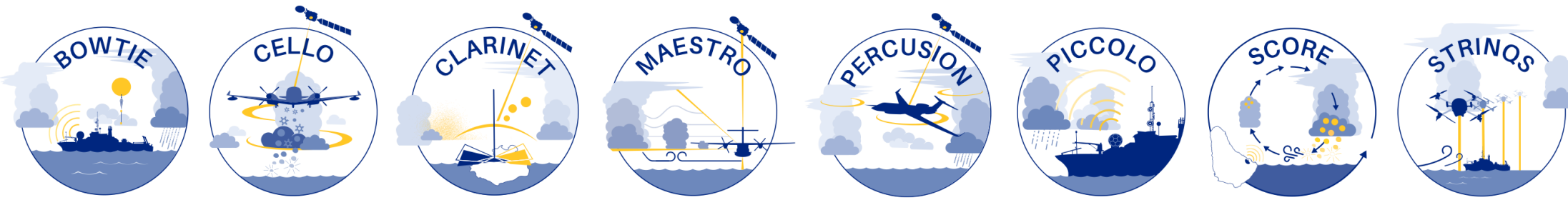


Airborne high spectral resolution lidar measurements to validate EarthCARE's ATLID L1/L2 optical properties

Silke Groß, Martin Wirth

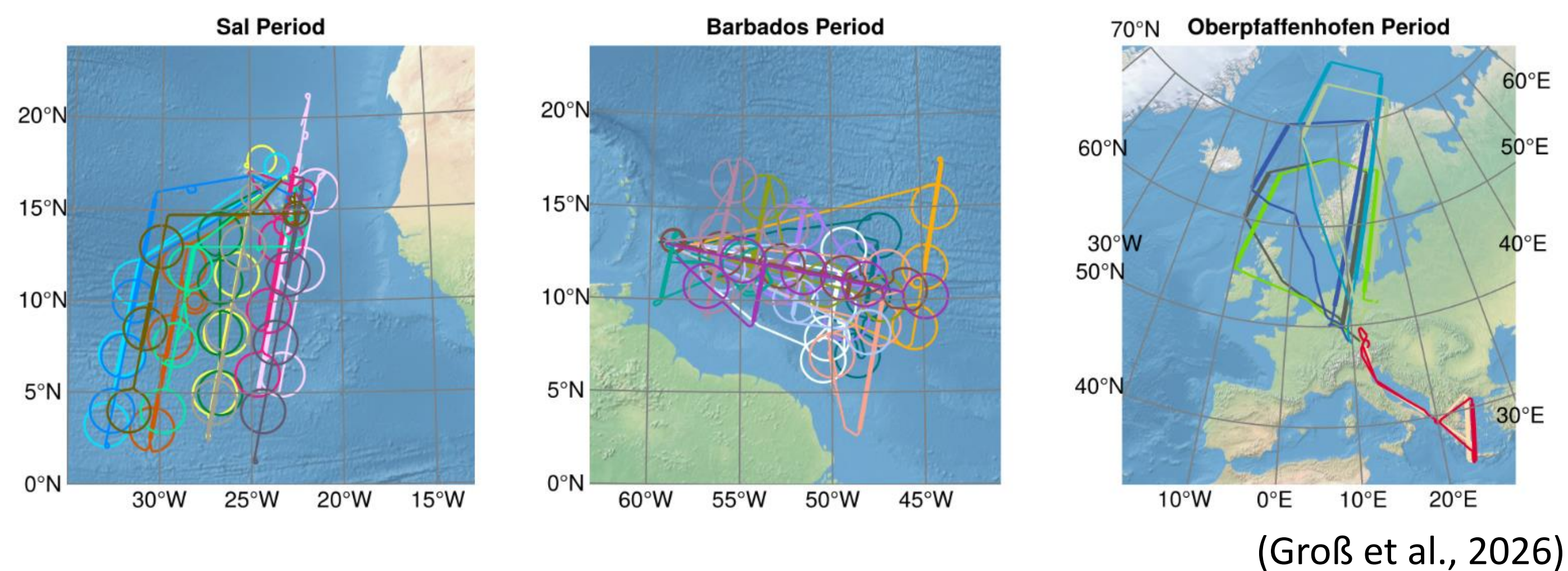
German Aerospace Center (DLR), Institute of Atmospheric Physics, Oberpfaffenhofen, Germany

ORCESTRA



(Stevens et al., 2026)

PERCUSSION



- ~300 flight hours, 30 flights, 3 locations
- Coordination with ground-stations, ship-borne measurements and other aircraft
- 33 underpasses under EarthCARE and 4 underpasses under PACE**

WALES lidar system

Combined airborne high spectral resolution (Esselborn et al., 2008) and water vapor differential absorption lidar (Wirth et al.2009) developed and built at the DLR Institute of Atmospheric Physics.



Aerosol

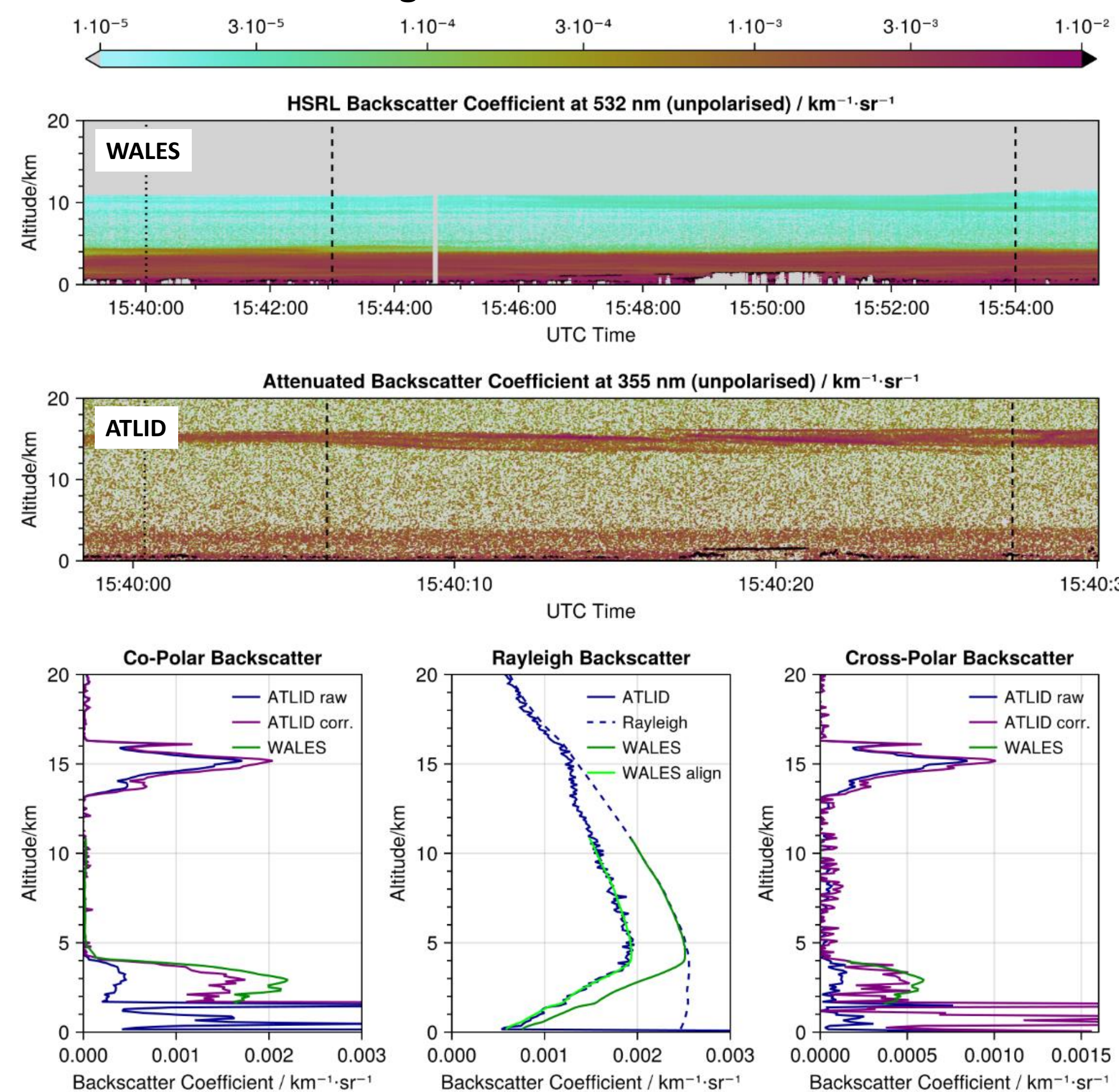
- Backscatter coefficient (532 nm and 1064 nm)
- Aerosol depolarization (532 nm)
- Aerosol extinction (532 nm – HSRL)
- Resolution: range ~15 m, time = 1s

Water Vapor

- H₂O mixing ratio (~935 nm)
- Resolution: range ~265 m, time = 25s
- Relative humidity (in combination with external temperature data)

ATLID NOM Level 1B – Baseline BA

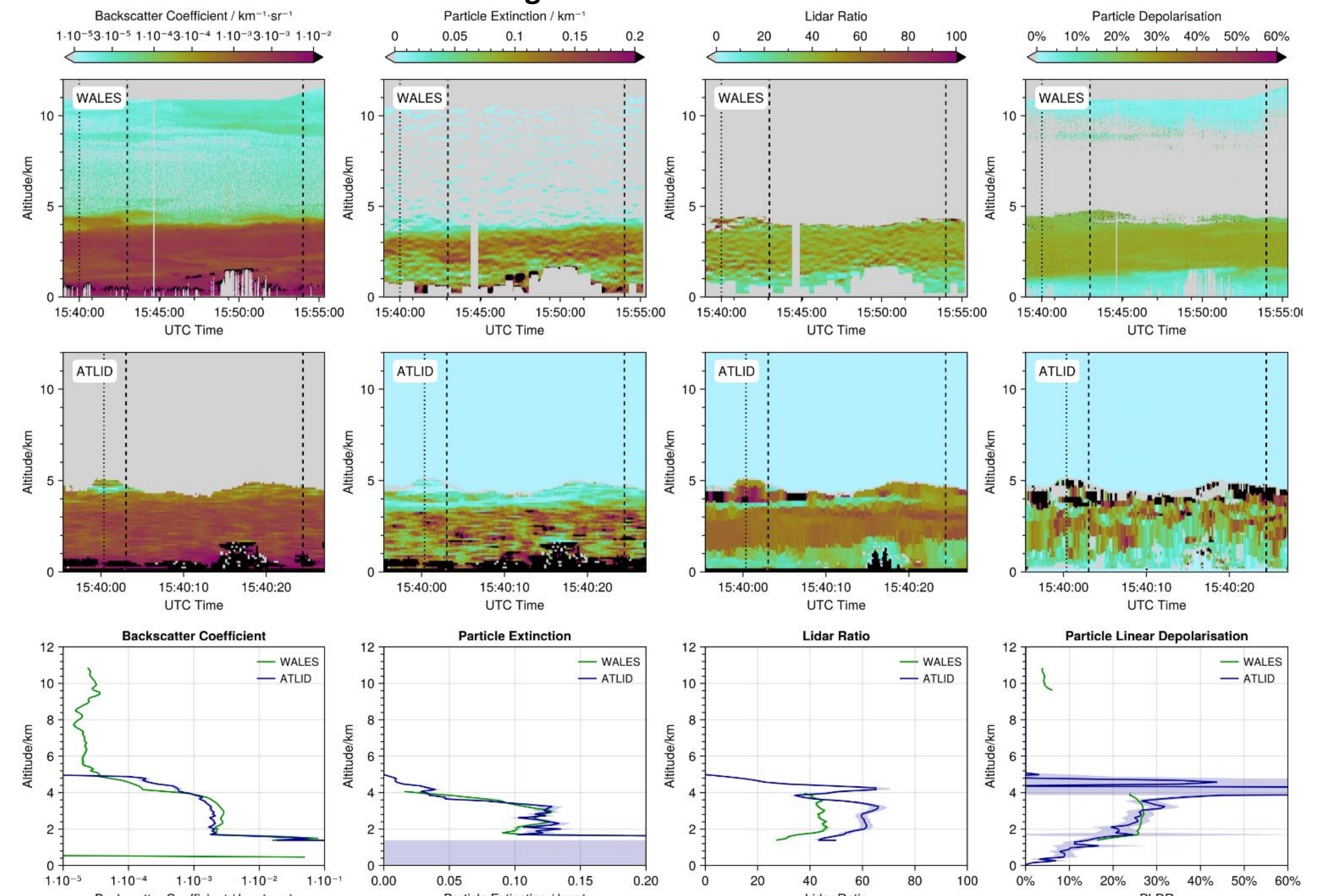
13 August 2024 – Orbit 01162E



→ the dotted line shows the position of closest match; the dashed lines mark the region (120 km) for the comparison of the profiles

ATLID A-PRO EBD Level 2A (Donovan et al., 2024) – Baseline BA

13 August 2024 – Orbit 01162E

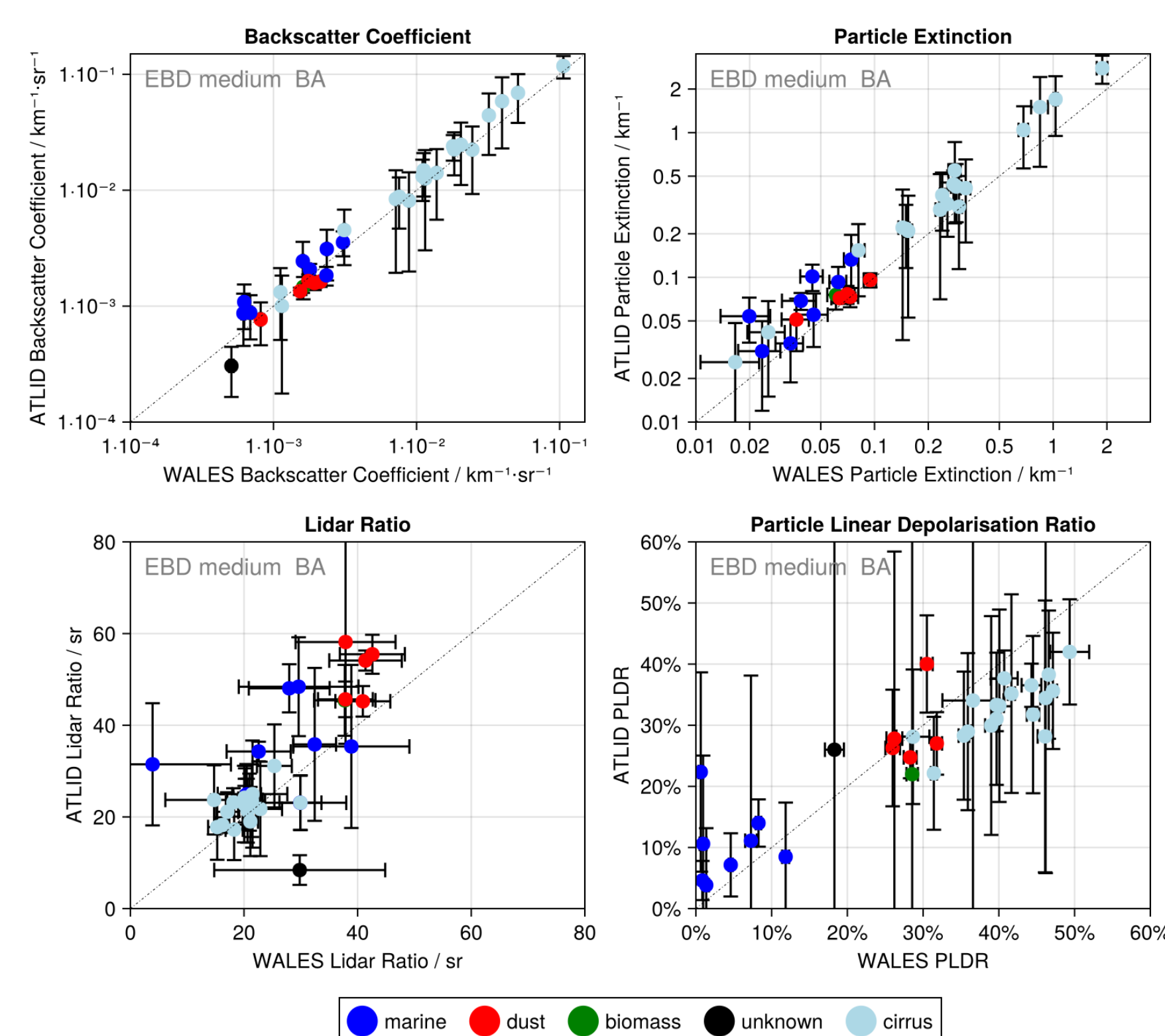


→ the dotted line shows the position of closest match; the dashed lines mark the region (120 km) for the comparison of the profiles

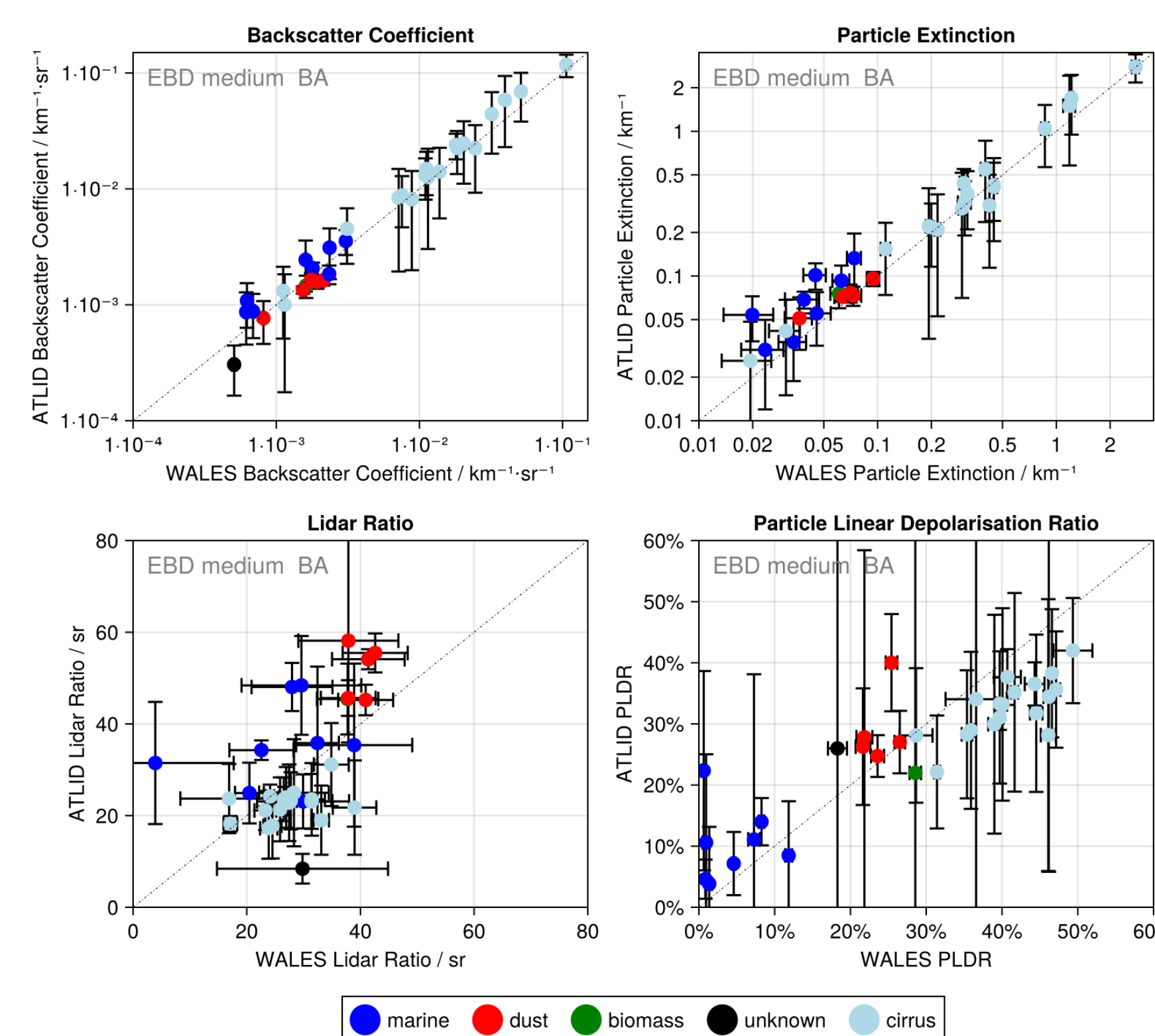
(Groß et al., 2026)

Statistical evaluation of ATLID Level 2A (Donovan et al., 2024) – Baseline BA

EBD – medium resolution



EBD MS-corrected – medium resolution



AER MS-corrected

