



EarthCARE 2026 Science and Validation workshop

8–12 June 2026 | Rhodes House | Oxford, UK

Status of the ATLID L1 and L2a data products

D.P. Donovan on behalf of the ECARE DISC ATLID IWG.

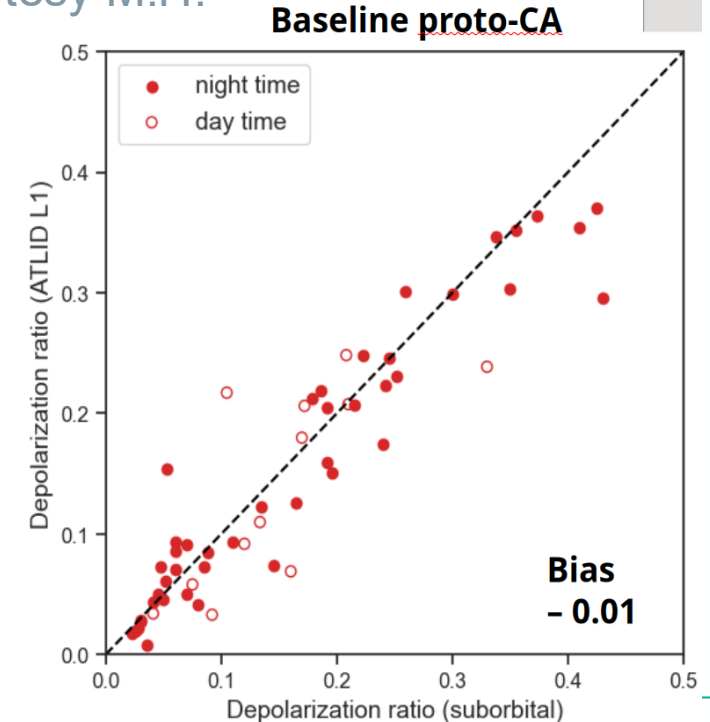
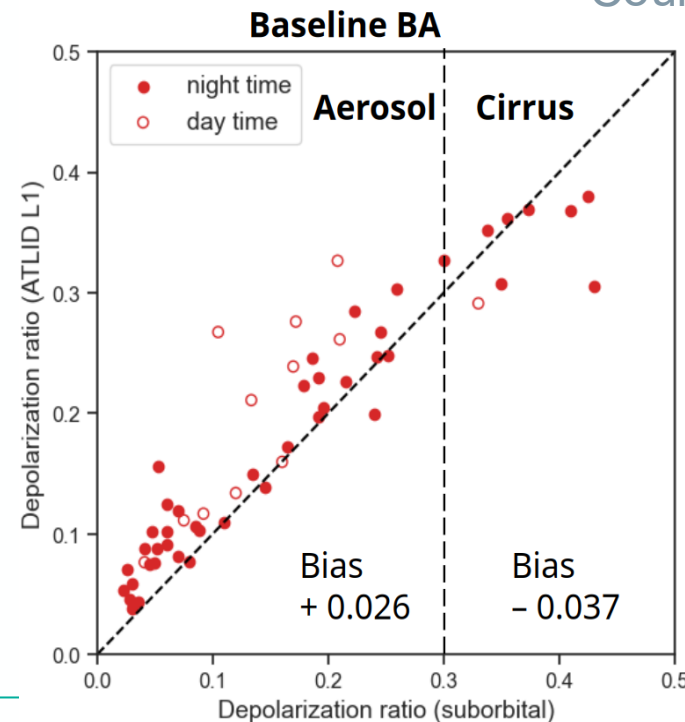
L1 processor updates (since December meeting)



Moving to Baseline AC

- Correction for issues related to detection chain DC offset being influenced by solar background
→ Better day-night consistency esp. in cross-polar channel.
- Application of imperfect charge-transfer correction procedure.
→ Better correction of 20km spikes
- Improved characterization and correction of polarization cross-talk.

Courtesy M.H.



L1 Product Issues



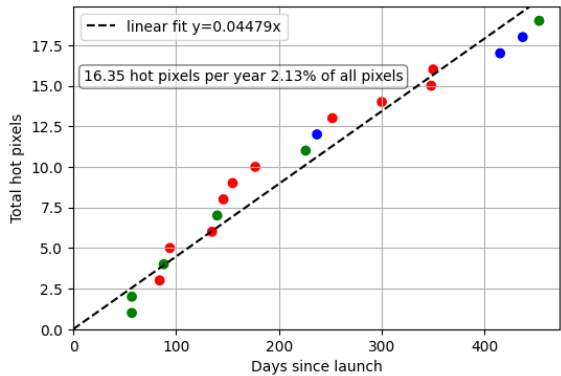
Baseline BD:

- Issue with a bug in the operational processor.

Depolarization cross-talk over corrected. Will be fixed by deployment of CA.

- Laser energy normalization issues
 - Gradual (expected) laser power reached a lower-limit threshold in the L1 processor that was set too high. Fixed by processor configuration update.
- Pixel #41 (20 km) of the Rayleigh channel became hot in later April and is now exhibiting RTS behaviour!
 - RTS → Dark Current levels change randomly. All of the other HPs are more-or-less stable.
 - Fix will not make it into CA
 - This and other HP/CP improvements are planned post-CA.

SEE: <https://earth.esa.int/eogateway/missions/earthcare/data/data-quality>



HP keep occurring

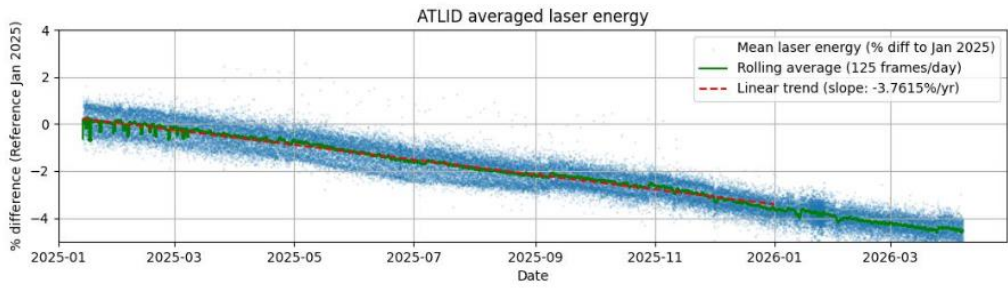


Figure 7-12: Laser Energy Monitoring

Laser behaving well

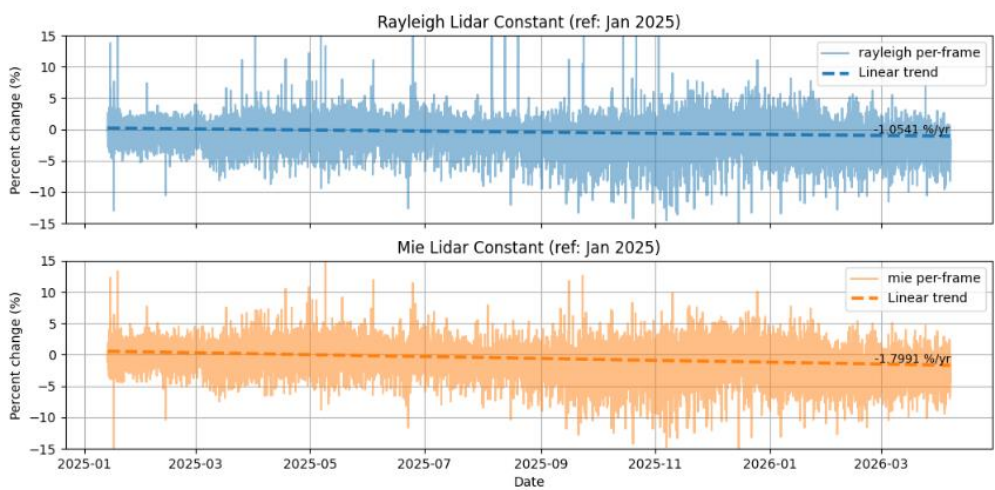
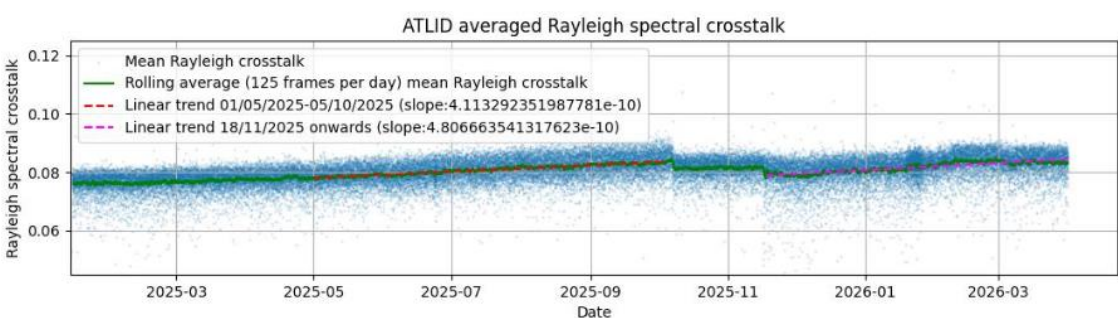


Figure 7-13: Lidar Constant Evolution

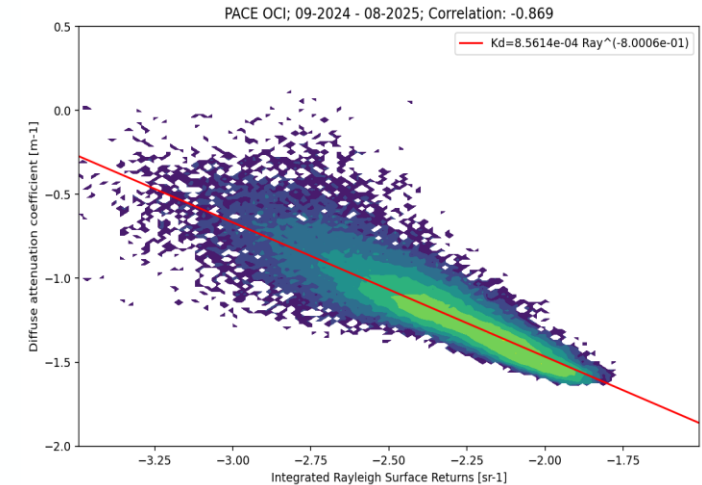
Cross-talk coefficients stable



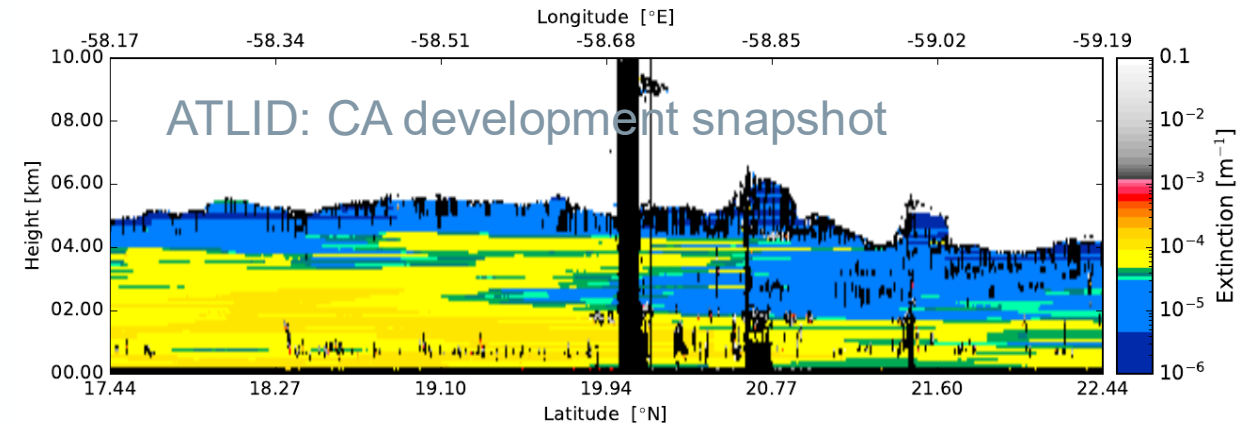
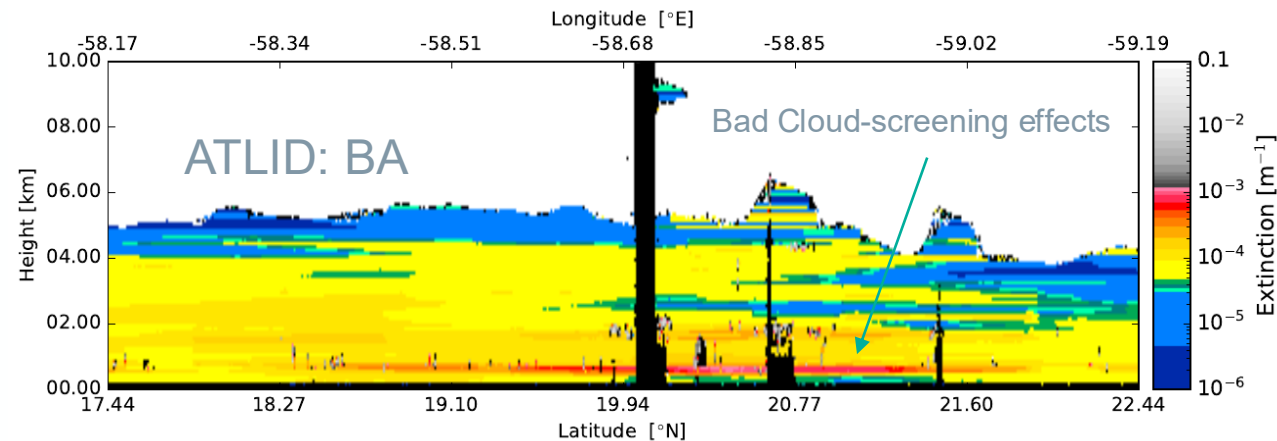
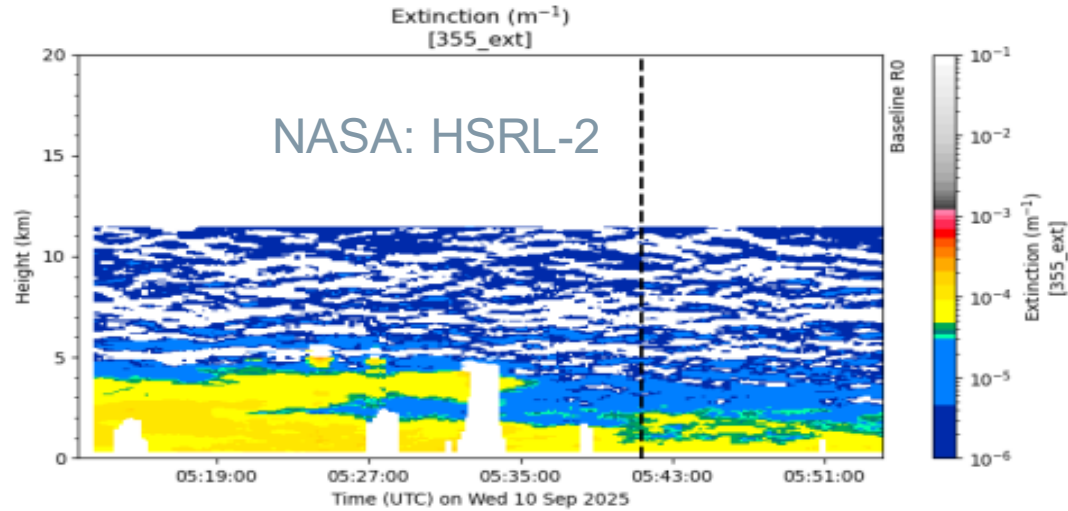
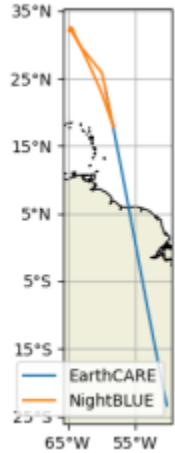
L2 updates to arrive with CA



- A-FM (ATLID Feature mask)
 - Improvements to surface detection.
 - Better higher altitude performance
 - Addition of diffuse attenuation coefficient using Rayleigh channel.
- A-PRO (Cloud and aerosol profiles of optical properties and classification)
 - Creation of one reported A-TC classification (which will be based on the low-resolution product).
 - High and Med resolution products will be eventually removed.
 - Bug fixes have made (esp. A-EBD) more stable (sometimes points below the surface were used!).
 - A special connected region check to help identify highly variable clouds has been implemented. This has impacts in situations such as e.g. “Popcorn Cumulus” conditions (see next slide).
 - Adjustments of Aerosol Classification priors will lead to more realistic aerosol typing!
 - Flagging and/or removal of uncertain layers based on retrieval uncertainties (e.g. depol and S) is being implemented. This will reduce “edge-effects”
 - Improvements to particles sizes used in MS correction.



NightBLUE example (Cloud screening improvements)

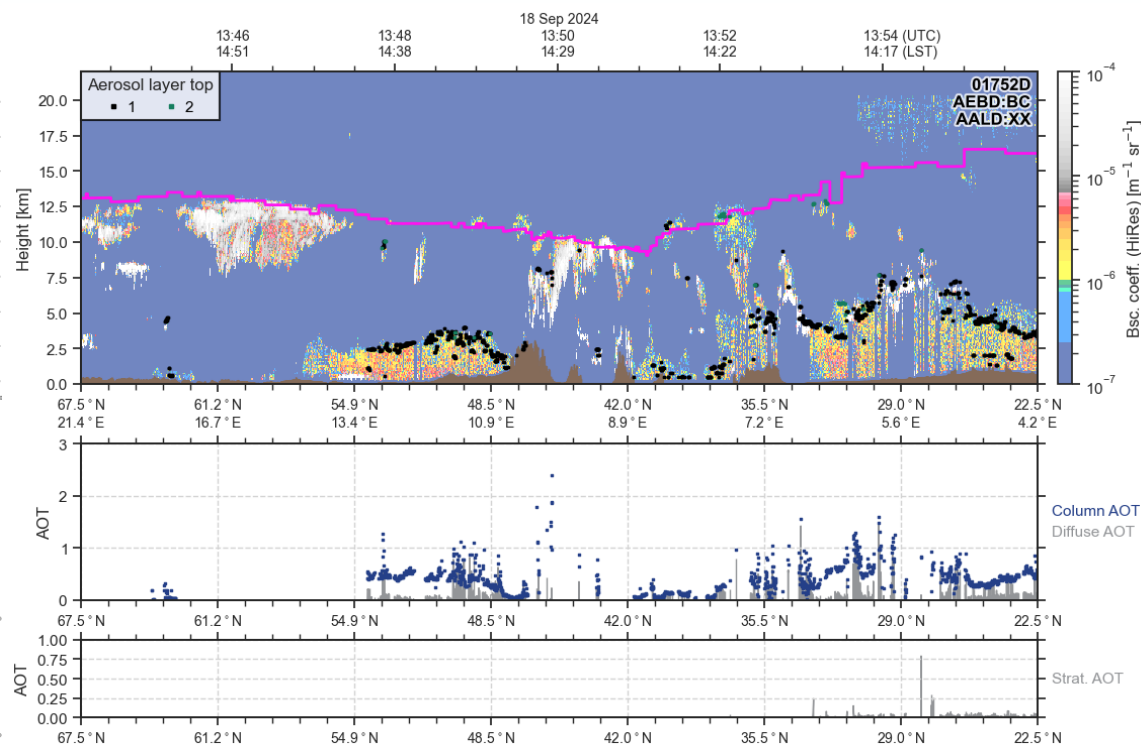
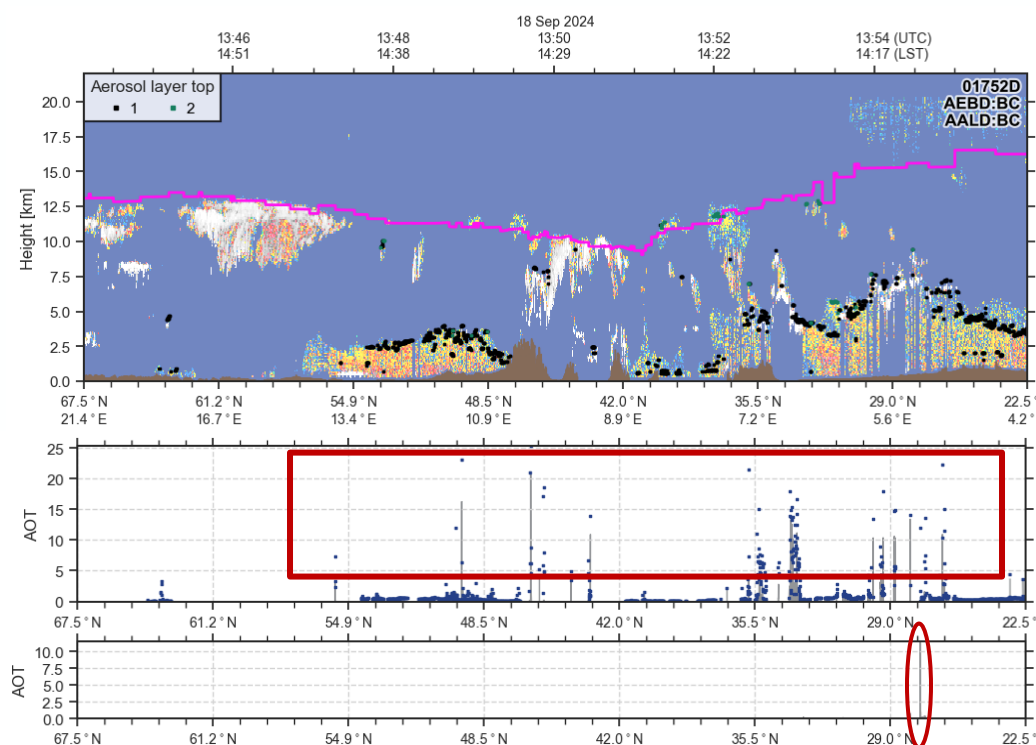


A-LAY updates for CA



Major improvements for upcoming baseline (CA):

- Improved reported AOT – extremely high AOT was reported to A-ALD product due to some cloudy profiles that were not identified by A-CTH subroutine. Additional filtering is now performed to the A-EBD extinction profiles before calculating AOT.
- Improved layer-mean depolarization ratio – quite often the A-ALD mean depolarization ratio was negative. Depolarization ratio profiles from A-EBD are now masked based on the respective uncertainties before calculating the mean. Improved layer-mean depolarization ratio – quite often the A-ALD mean depolarization ratio was negative. Depolarization ratio profiles from A-EBD are now masked based on the respective uncertainties before calculating the mean.



- ATLID continues to perform well.
- Disregarding a couple of miss-steps (BD release) the L1 data is of high quality, and CA will be a marked improvement esp. w.r.t to depolarization.
- ATLID looks on course for about 10 years of measurements!
- HP etc. management is an issue and will continue to be.
- L2 processors are continuing to evolve.
- CA will deliver a number of improvements!
- L2 re-processing planned for early fall.
- L1 ATLID CA will be deployed in the optional stream soon and reprocessing will commence this summer.
- CAL/VAL data from many diverse sources is playing an important role in the L2 evolution and debugging!