



ESA-JAXA Pre-Launch EarthCARE Science and Validation Workshop

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

EVID17: EarthCARE Cal/Val Using the NASA Micro Pulse Lidar Network (MPLNET)

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Funding: Five-year proposal (2021 – 2026) through the NASA Participating Investigator Program (NNH20ZDA001N-EUSPI) to validate EarthCARE using MPLNET

Task 1: Validate aerosol, cloud, and planetary boundary layer heights using L3 MPLNET products

- L3-EC products will be provided to the EarthCARE validation data center
- Same statistical analysis used for L3 products, which will be housed on MPLNET website

Task 2: Compare drizzle occurrence and properties

- Automated precipitation detection has been incorporated into MPLNET processing (developmental-level)
- Will be used to identify potential case studies for drizzle from CPR products (C-TC, C-CLD)

Simone Lolli – upcoming talk

Task 3: Evaluate EarthCARE-based cirrus datasets for TOA CRE (top-of-atmosphere cirrus cloud radiative effect)

- Fu-Liou-Gu model used to solve cirrus cloud radiative properties of single-layered cirrus clouds
- Results from EarthCARE will be compared to similar TOA CRE from MPLNET and historical CALIPSO dataset

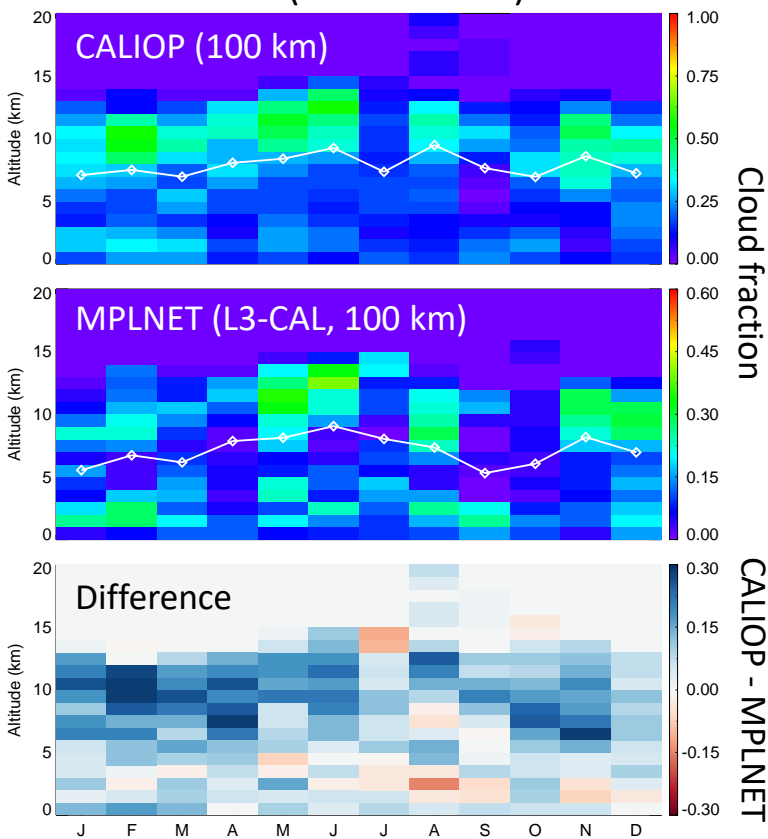
Erica Dolinar – earlier talk/poster



Update: Preliminary testing performed using CALIOP observations and EarthCARE simulated data

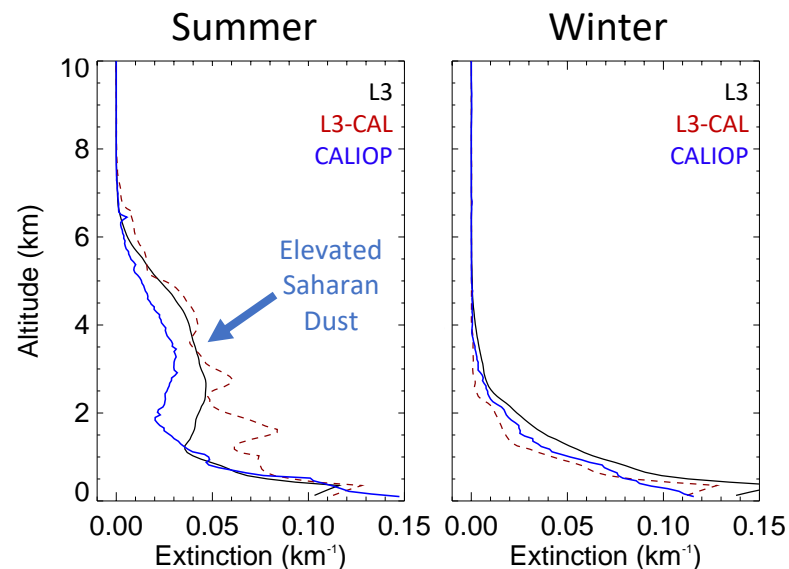
Cloud Occurrence

GSFC (2016 – 2021)



Aerosol Profiles

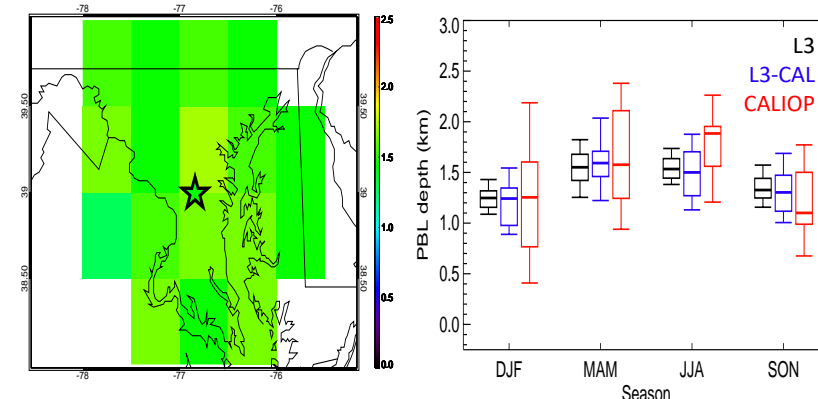
Santa Cruz Tenerife (2018 – 2021)



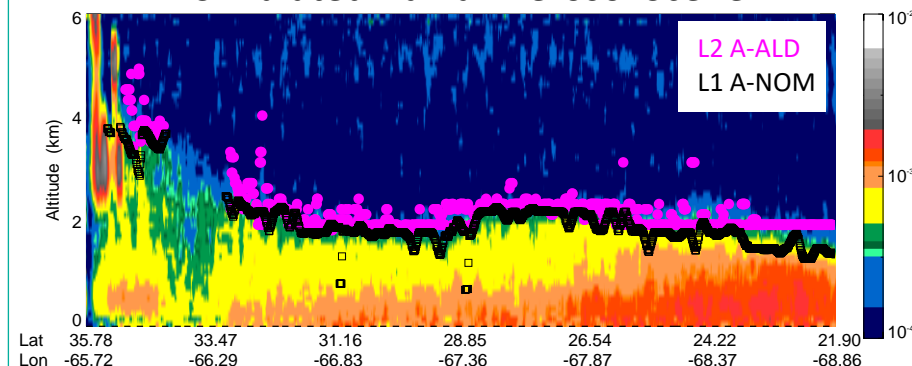
*Due to the difference in MPLNET/ATLID wavelengths, we will not attempt to validate extinction profiles. However, we will evaluate aerosol layer heights

Planetary Boundary Layer Height

GSFC (2016 – 2021)



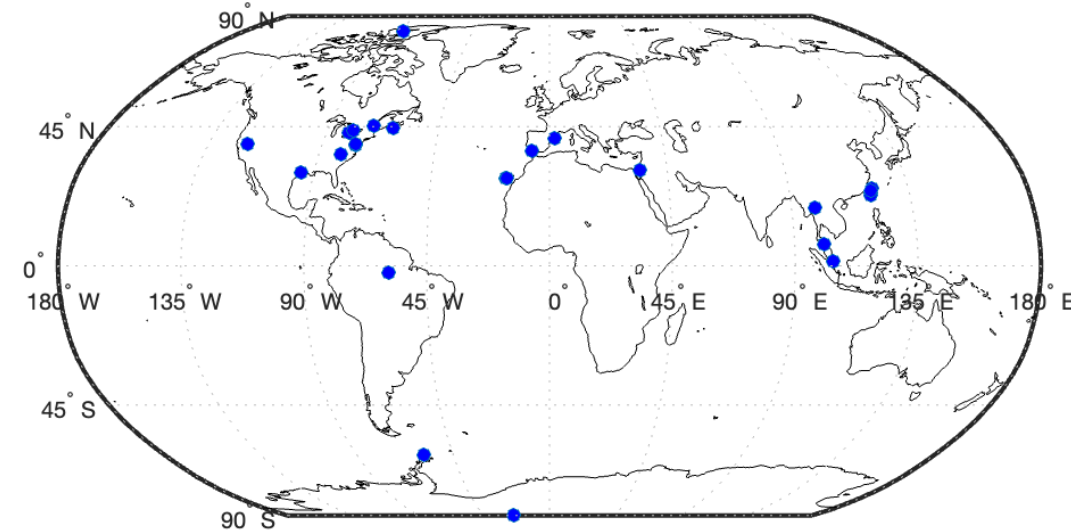
Simulated Halifax Aerosol Scene





Preparation for EarthCARE Launch

- The L3 product development will be finalized soon and ready to begin operational processing by launch
- Manuscripts describing the L3 processing and CALIOP comparisons as well as Tasks 2 and 3 are currently in preparation.
- Simulated ATLID datasets have been used to modify the code to ingest EarthCARE data
- Initial conversion of correlative data to GEOMS format has begun and will be finalized based on recommendations from the breakout session at the EarthCARE Cal/Val workshop
- MPLNET site planning:
 - New sites in Western North America, closer to fires for plume monitoring
 - Additional sites in Arctic, others worldwide that were delayed from COVID
- Judd Welton will discuss MPLNET activities with other GALION networks later



<https://mplnet.gsfc.nasa.gov>