ARES data portal: new products

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Italiadomani

Agenda

- Aerosol Typing
- GARRLiC - Combined lidar + photometer data
- New release level 3 climatological

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- **Aerosol Typing**
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The aerosol typing module

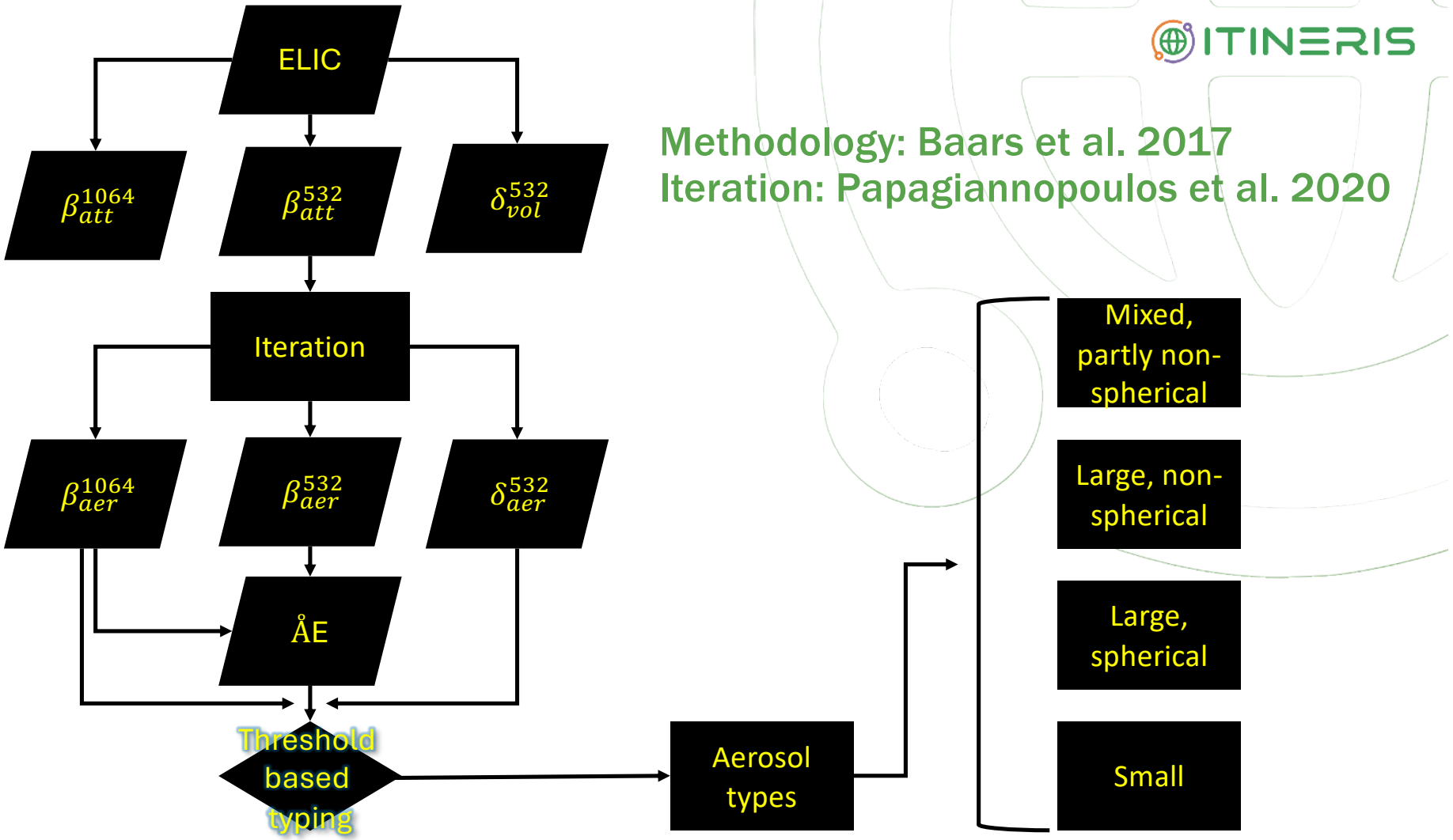
- **HiRAC: High Resolution Aerosol Classification**

Its goal is to provide an aerosol class mask using calibrated lidar signals (ELIC: 532/1064 nm attenuated backscatter + 532 nm depolarization ratio)

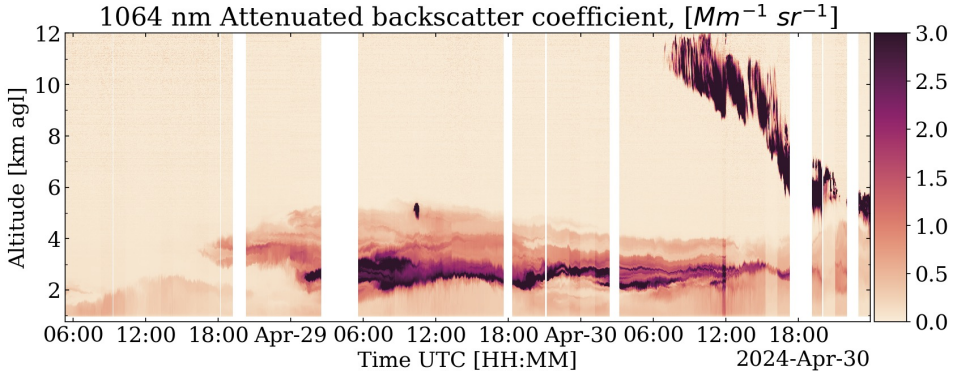
The aerosol classification can be readily available night/day.

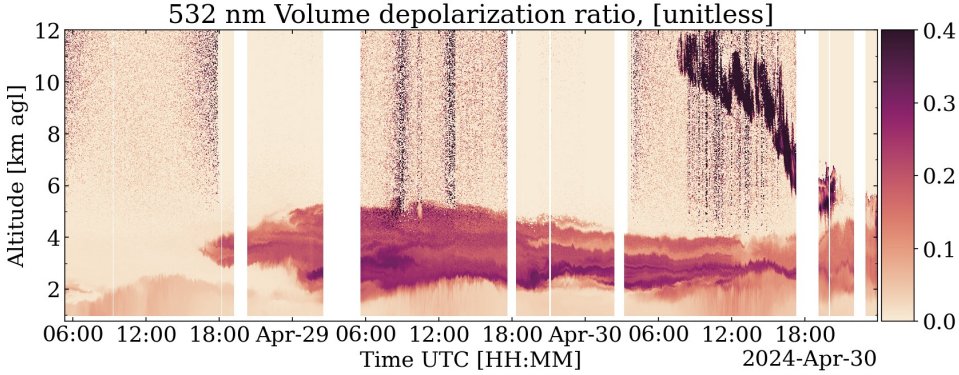
- The aerosols are classified by their physical features (shape and size) into 4 classes:
  - small
  - large, spherical
  - large, non-spherical
  - mixed, partly non-spherical

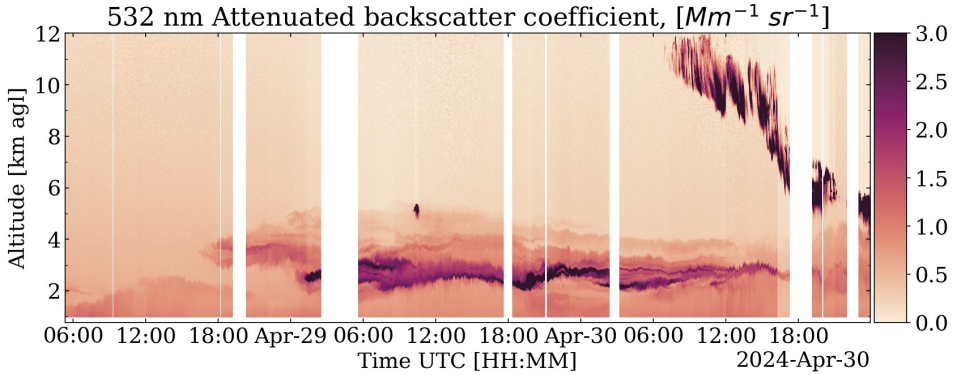
Methodology: Baars et al. 2017
Iteration: Papagiannopoulos et al. 2020

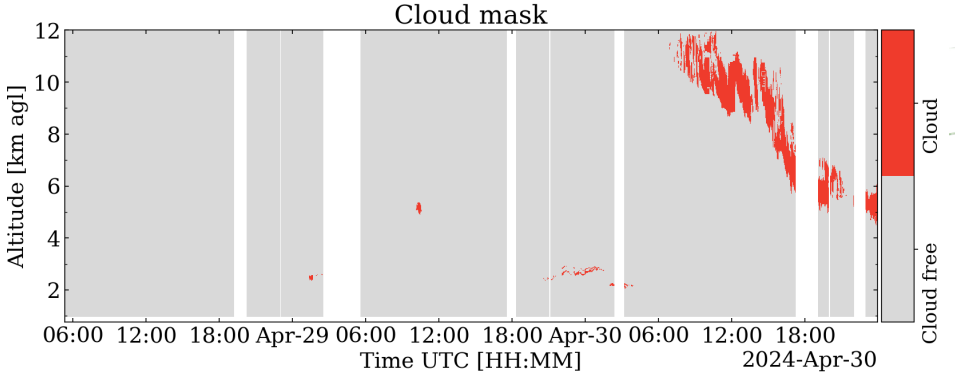


Potenza 29-31 April 2024









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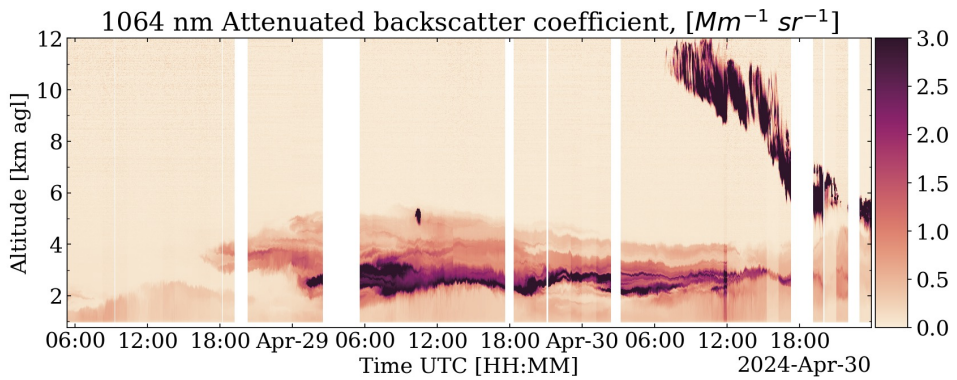

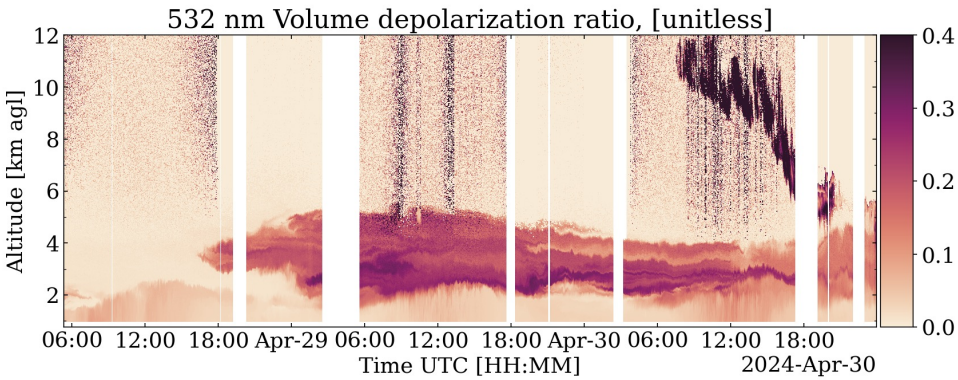

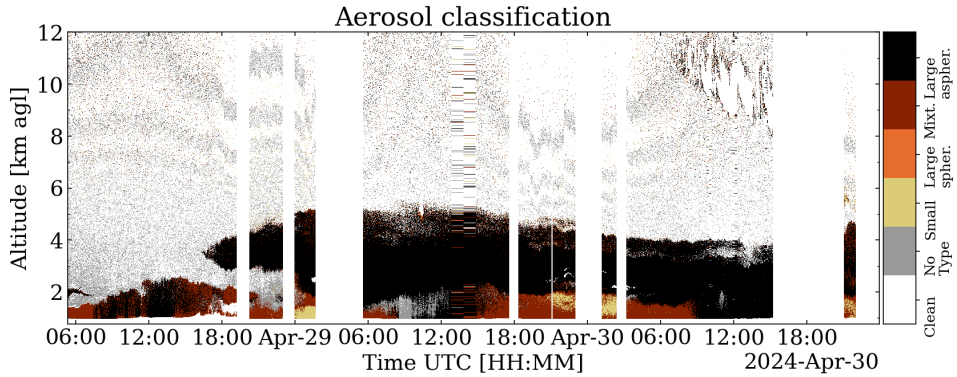

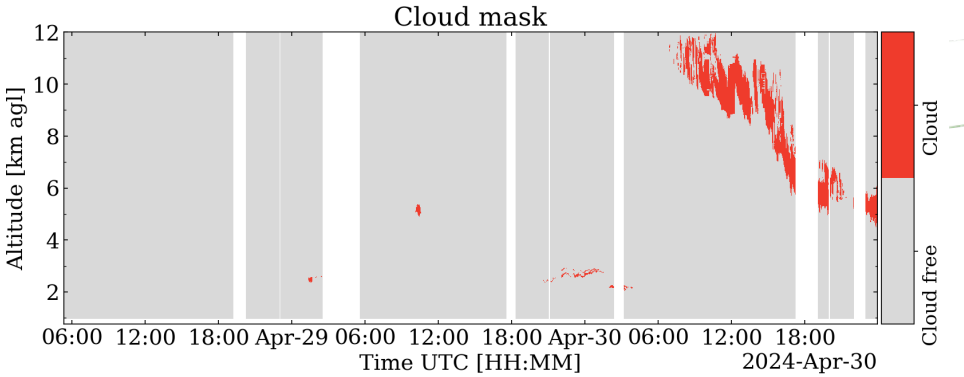

Aerosol typing

- Steps undertaken:
  - **High resolution aerosol typing** – i.e., HiRAC – is available in a CNR-IMAA Post Processing Server
  - Tested for a CNR-IMAA Campaign during last Spring
  - **Low resolution aerosol typing** – based on ELDA – is also available in the same server
    - **MAC** (Papagiannopoulos et al. 2018): ready
    - **NATALI** (Nicolae et al. 2018): disentangle from GUI; prepare output
    - **Heteac-Flex** (Floutsi et al. 2023): matlab code not yet converted; prepare output
  - Note: the low-resolution typing makes use of the layering module (N.Siomos)
- Plans:
  - Fine tune the existing algorithms (end of 2024)
  - Make available Natali/Heteac-Flex (Spring 2025)

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- **GARRLiC - Combined lidar + photometer data**
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GARRLiC: "Generalized Aerosol Retrieval from Radiometer and Lidar Combined data"

- GARRLiC products: simultaneous inversion of multi-wvl LIDAR and photometric measurements to retrieve microphysical and derive optical properties of aerosols:
  - Vertically resolved variables :
    - Volume concentration
    - Extinction coefficient
    - Back scattering coefficient
    - …
  - Column integrated variables :
    - Size distribution
    - Complex Refractive Index
    - Aerosol Optical Depth (total and absorbing)
    - Lidar Ratio
    - Effective radius
    - SSA
    - …

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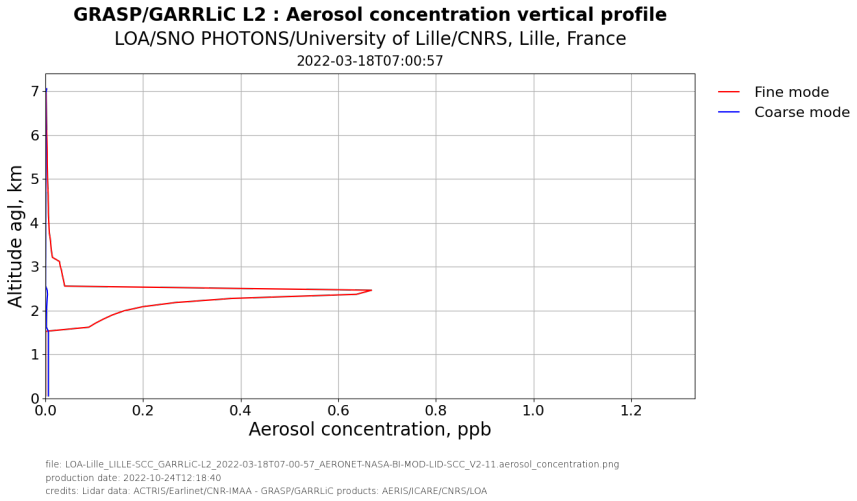

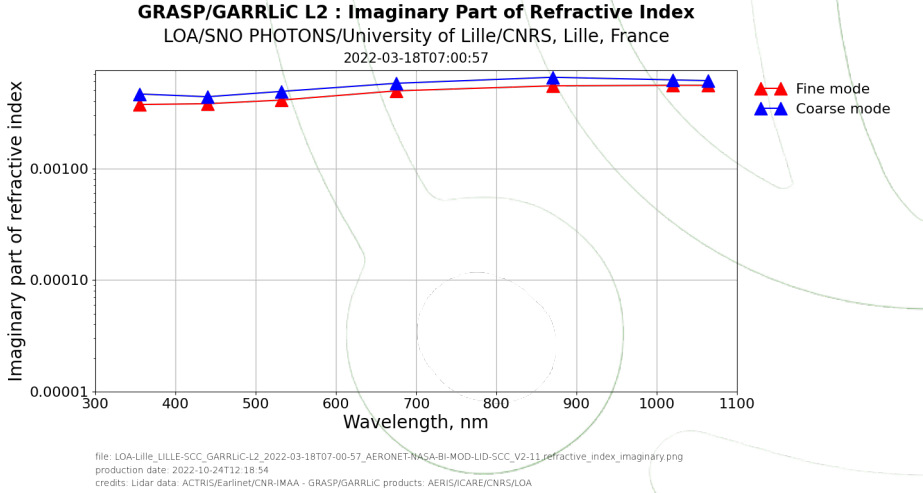

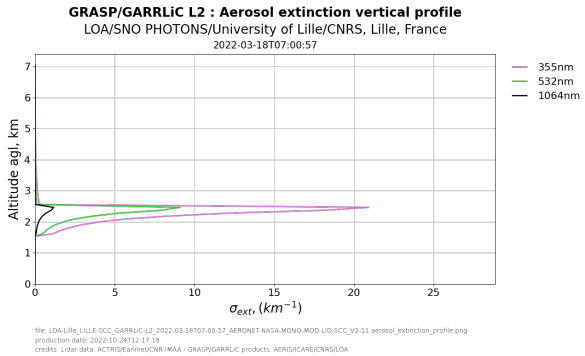

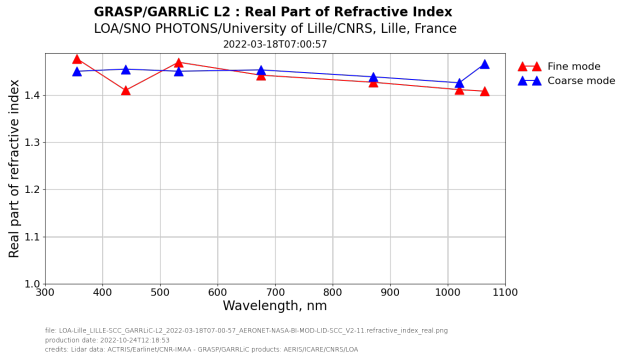

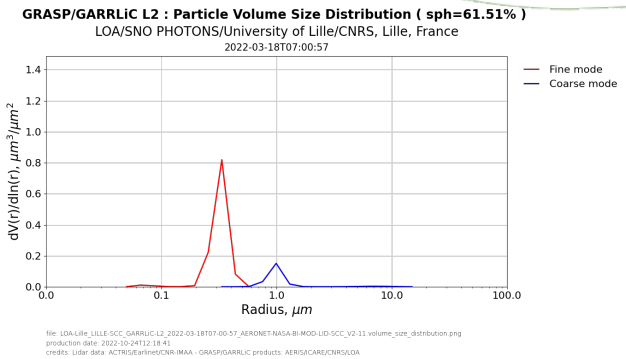

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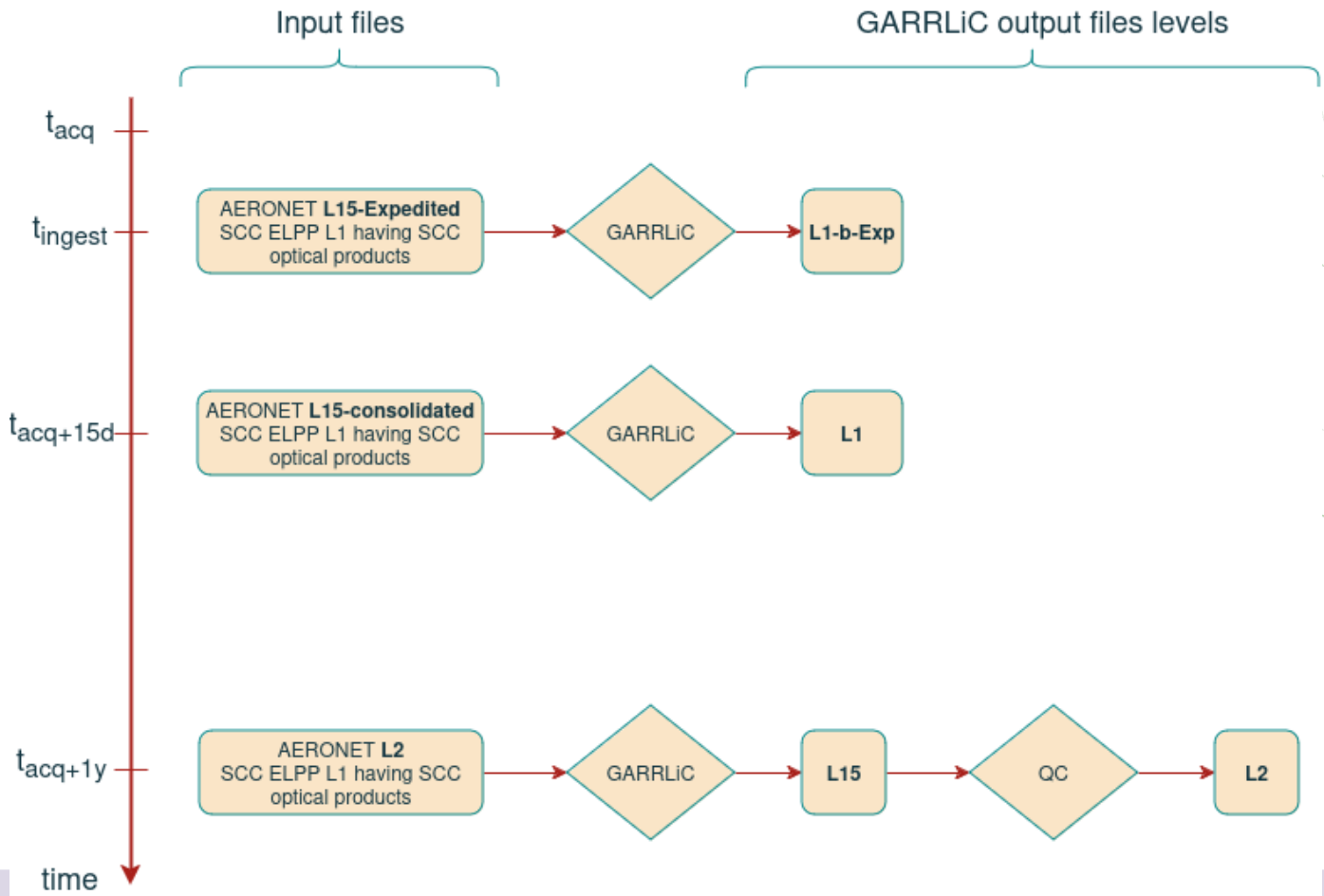

GARRLiC: “Generalized Aerosol Retrieval from Radiometer and Lidar Combined data”

- **GARRLiC outputs will be available through the ACTRIS DC portal :**
  - Downloading data in the catalog
  - Visualization tools in development accessible in the portal

- **Implementation status:**
  - Data made available to the CNR since the end of October via API
  - Integration into the data portal by the CNR in Q2-2025
  - Visualization tool at the end of this year
- **Documentation:**
  - In the ACTRIS data portal

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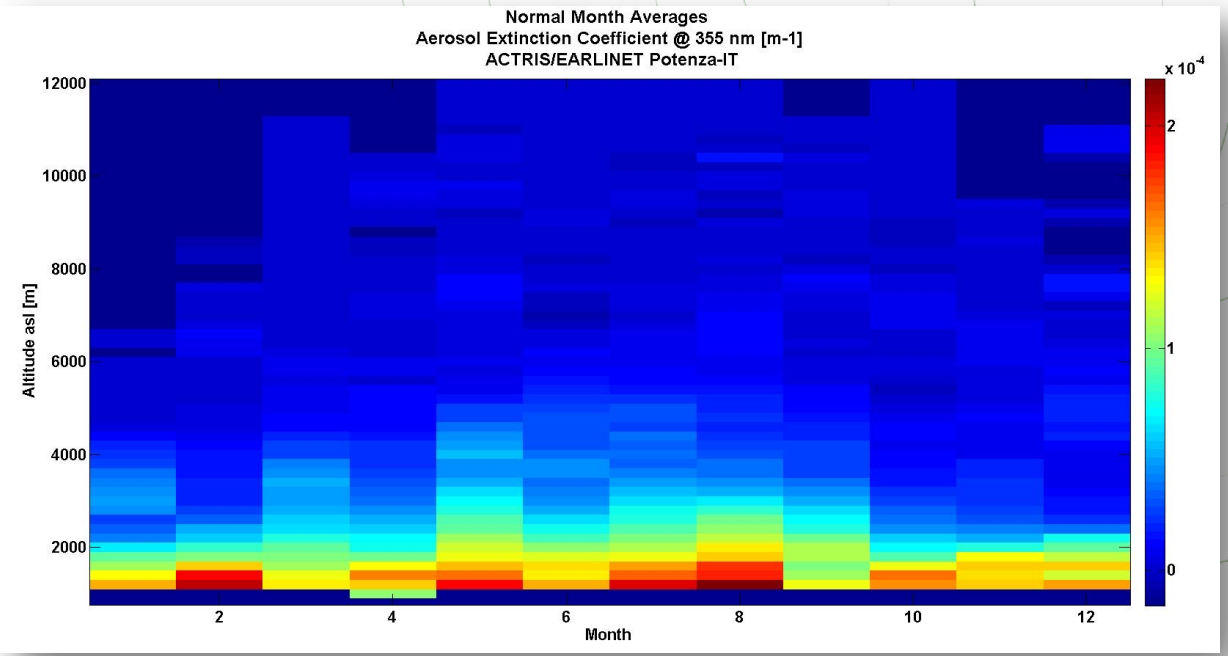
- **New release level 3 climatological**

Level 3 climatological dataset: 2000-2021

- Based on Level 2 – QC v03 data available.
- Added 2 years respect to previous release as scheduled (biannual release).



- The 33 stations already included in the previous release + potentially additional ones providing at least 3 years of data over the whole period.

Work done

- Consistency checks with previous release (change of personnel working on this task).

- Code available on GithHub: https://github.com/actris-ares/actris-level3-aerosol-profiling-climatology.

- Climatological dataset identification

  2000-2020 climatological == regular measurements performed on Monday and Thursday.

  2020-2021 climatological == measurements performed on the base of schedule defined into CAMS and adopted as standard.

- Overpasses updated down to end of CALIPSO mission.

Still to be done

- Inclusion of potential new stations.
- Request of info for the DOI publication -> to be sent out in December.
- Update of documentation.
- Release of new dataset (expected in 1 month) and related DOI association (2025).

ITINERIS

THANKS!

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