

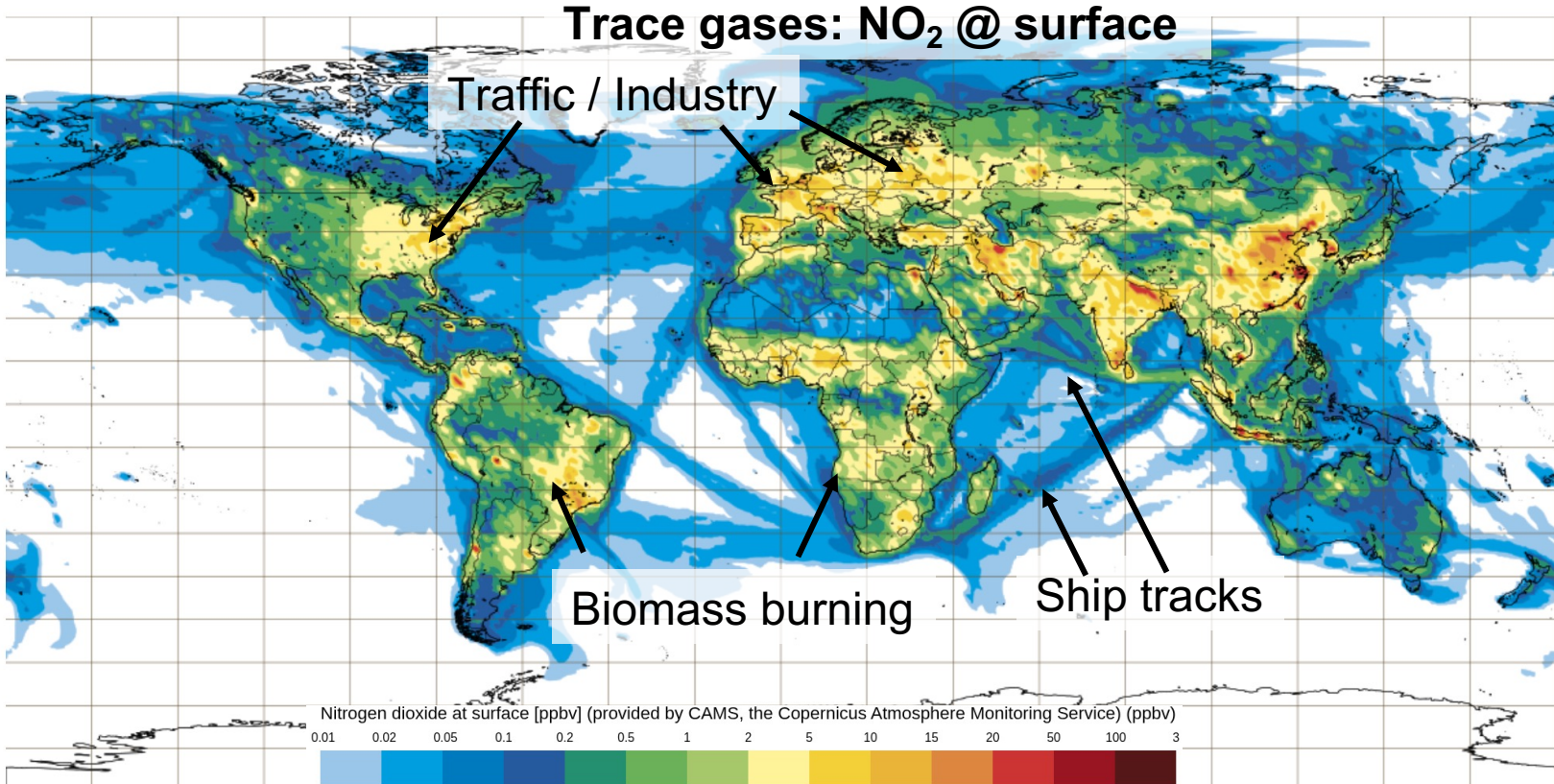
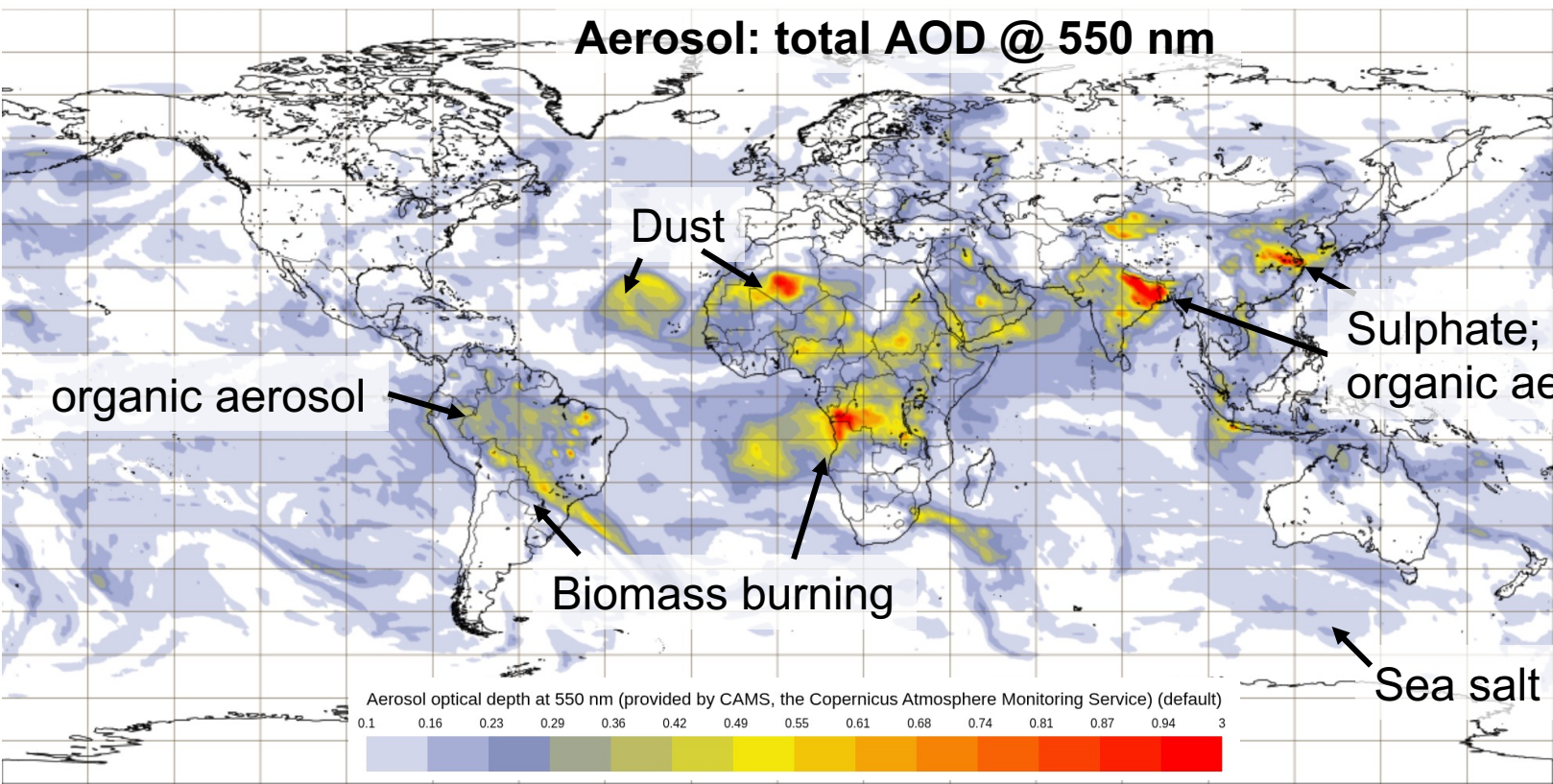


A pathway for improved monitoring of global aerosol aspects, informed by satellite retrievals

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CAMAERA: Aerosol research for CAMS

CAMS (Copernicus Atmosphere Monitoring Service) provides consistent and quality-controlled information about atmospheric composition relevant for air pollution, solar energy, greenhouse gases monitoring and climate forcing, relying on a range of satellite data products and modeling capabilities.



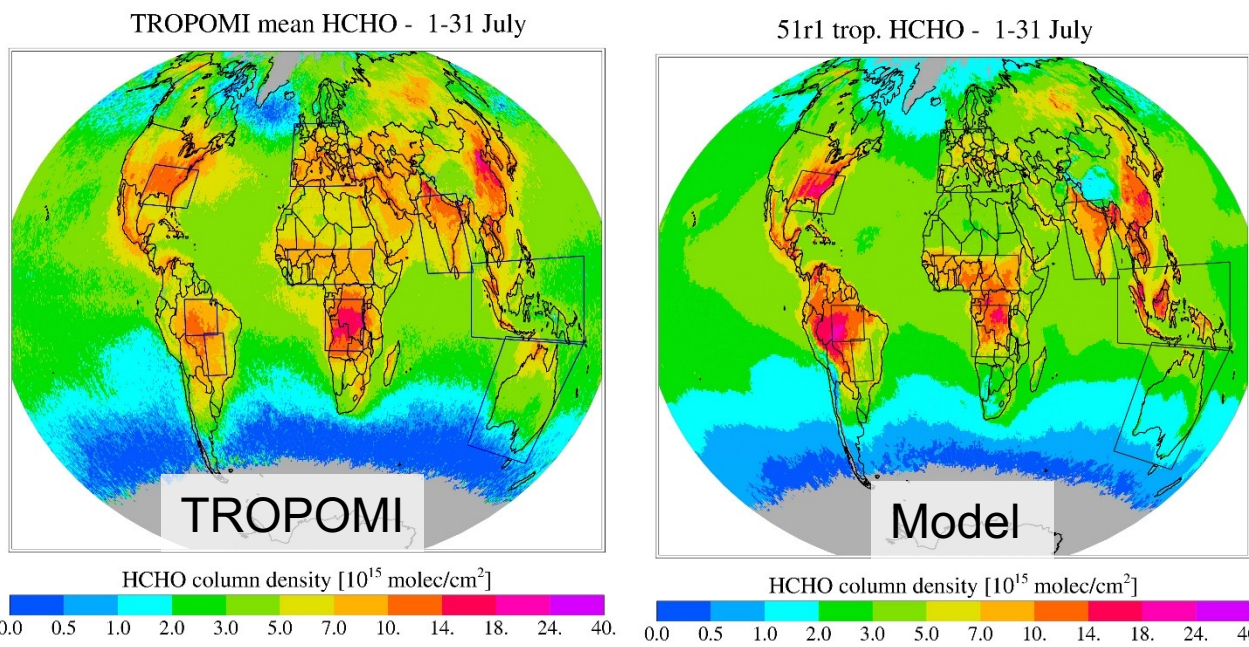
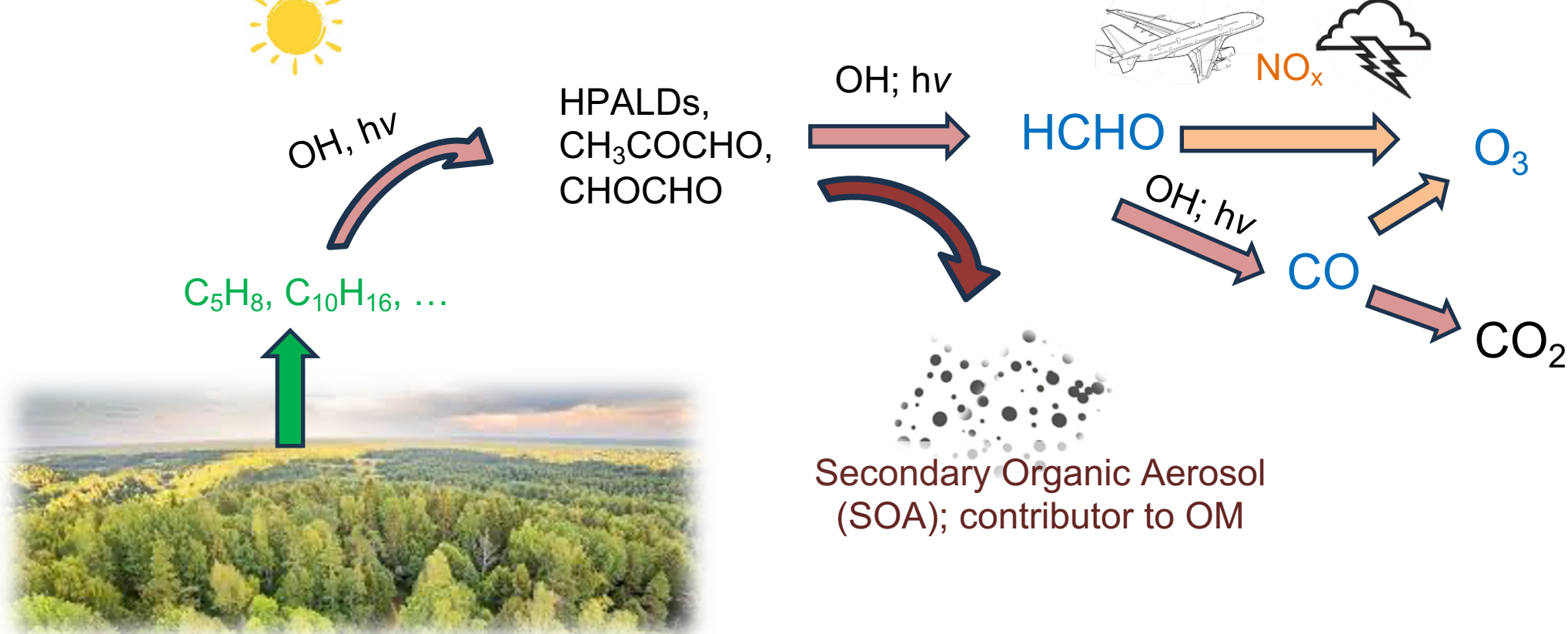
CAMAERA (CAMS AERosol Advancement) is a Horizon Europe Project to support the development of CAMS with emphasis on **aerosol-related aspects**. Emphasis is given to:

- the production of secondary aerosol from precursor gases
- Improve aerosol modeling capacities of regional and global systems
- Development of new data assimilation methods
- Foster exchanges between regional and global components of CAMS

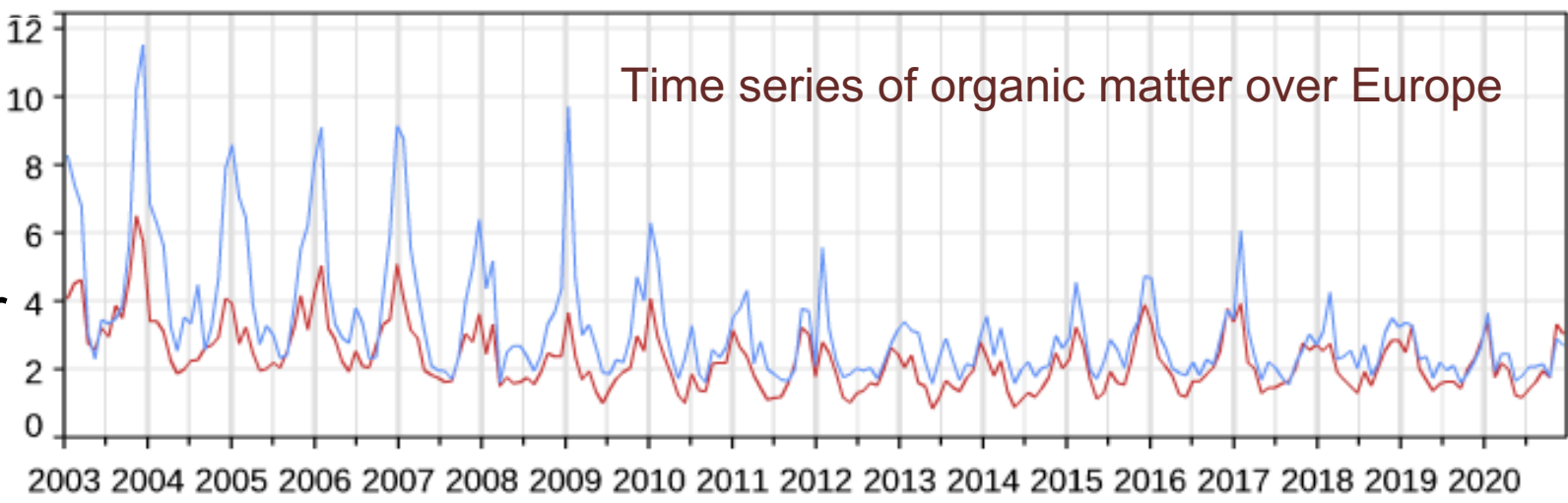


The role of secondary aerosol, and use of satellite data

Biogenic VOC's (isoprene, terpenes, ...) contribute to Secondary Organic Aerosol, HCHO, secondary CO formation and O₃ production;

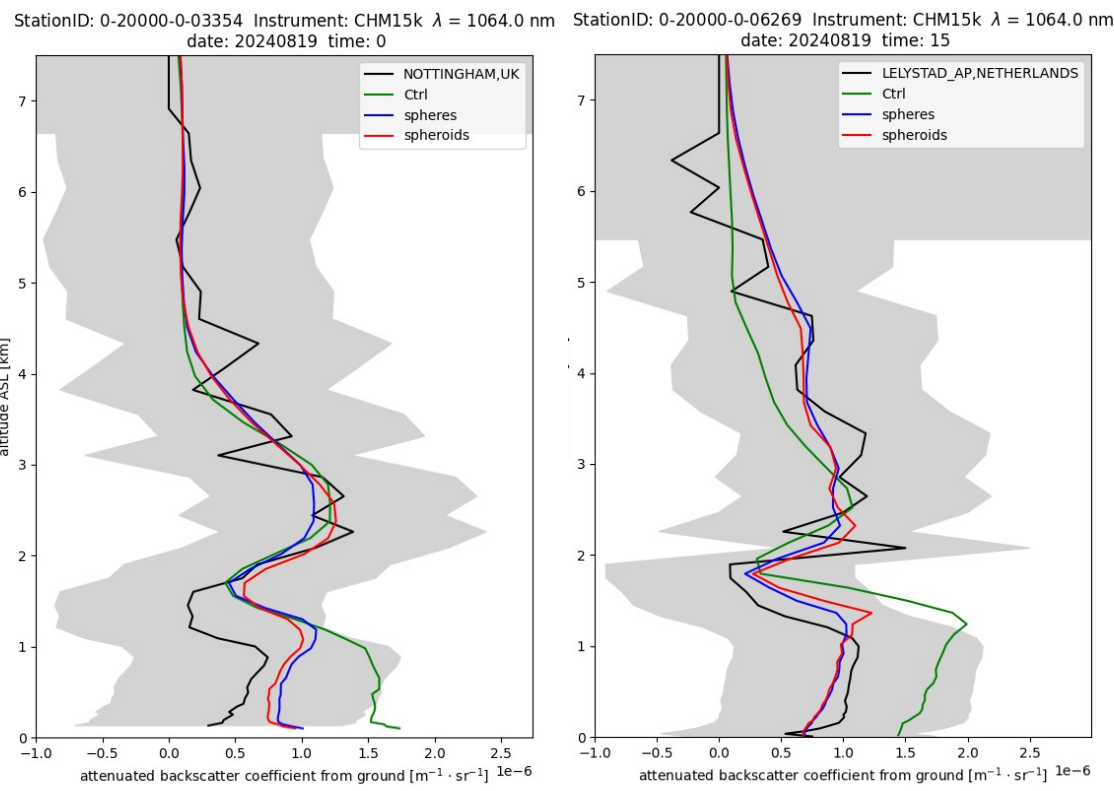
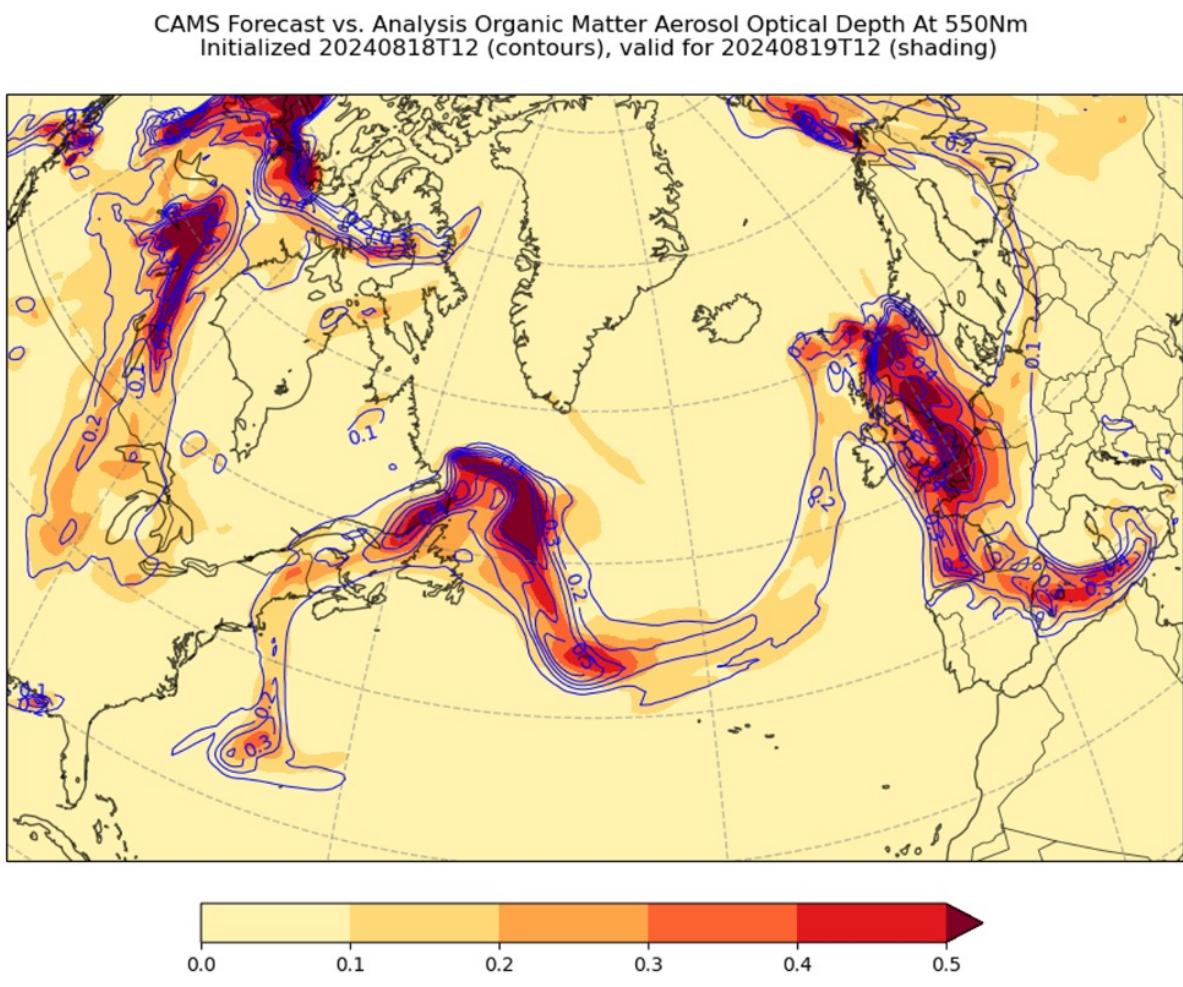


OM_surf (ug/m3) Mean. Model (eac5_cr_lowres) versus EBAS. 21 sites in Europe. 1 Jan 2003 - 26 Dec 2020. 00Z, T+12 to 24. Ver0D 12.16.1.

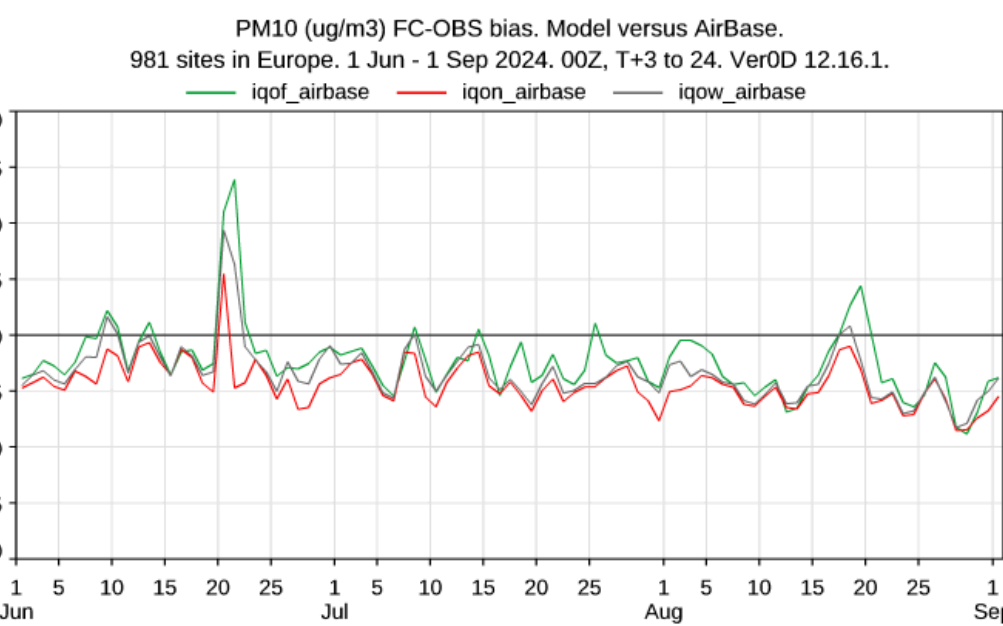
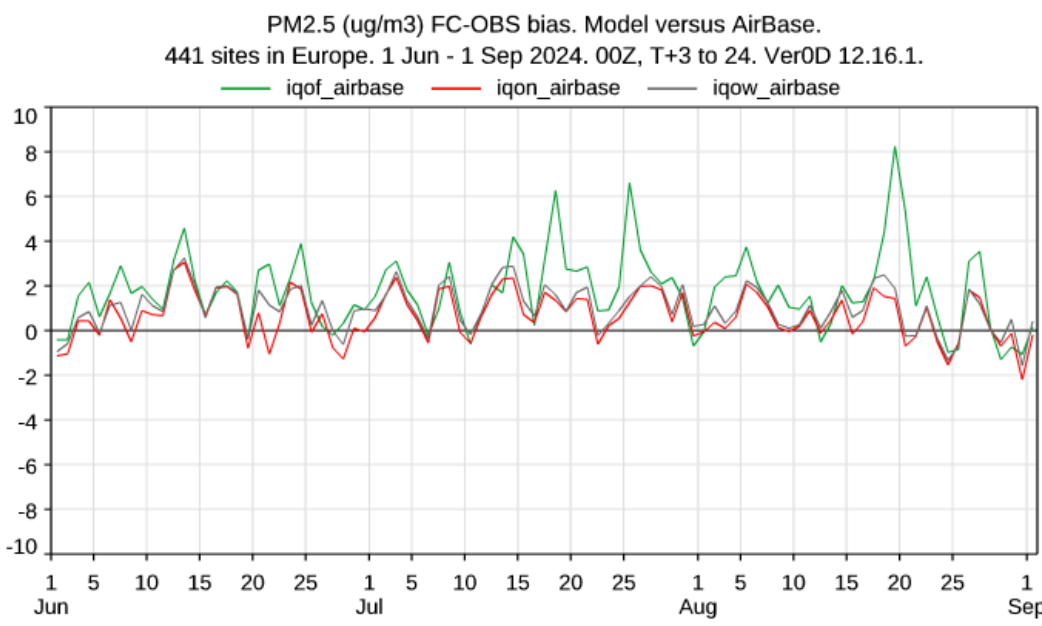


Assimilation of vertically resolved aerosol structures

- The assimilation of vertically resolved observations such as those provided by EarthCARE, or through lidar / ceilometer, could constrain the simulated aerosol profiles.
- CAMAERA implemented the data assimilation of vertically resolved observations from the Europe E-profile network.
- E-profile provide backscatter profiles from ground-based lidars and ceilometers at different wavelengths (532, 910 and 1064nm) with a good density over Europe.
- The data assimilation improves on the analyzed and simulated vertical profile of aerosol backscatter as well as on simulated PM2.5.



Analyzed aerosol backscatter coefficient at 1064nm over the vertical compared to data from E-profile observations (not assimilated), on 4/9/2023. Reference run (green), assimilation E-profile data (red and blue), with different assumptions about the particle shape.



Evaluation of surface PM2.5 (left) and PM10 (right) during summer 2024, Reference run (green), assimilation E-profile data (red and gray), with different assumptions about the particle shape.