

Report on the outcomes of a Virtual Mobility¹

Action number:

Grantee name: Christodoulos Biskas

<u>Virtual Mobility Details</u>
Title: EarthCARE validation activities at Thessaloniki, Greece

¹ This report is submitted by the grantee to the Action MC for approval and for claiming payment of the awarded grant. The Grant Awarding Coordinator coordinates the evaluation of this report on behalf of the Action MC and instructs the Grant Holder Manager to verify the grant documents compliance and proceed with the payment.

Description of the work carried out during the VM

During the virtual mobility, I participated in the EarthCARE observational campaign and carried out a series of coordinated atmospheric measurements at the Laboratory of Atmospheric Physics. My main responsibility was the acquisition, organization, and preparation of the campaign data for further analysis and sharing with the collaborating institutions.

All measurements were conducted at the Laboratory of Atmospheric Physics of the Aristotle University of Thessaloniki in Thessaloniki, Greece (40.63°N, 22.95°E, 60m a.s.l.). I performed measurements using the lidar system, the SVC spectroradiometer and the Calitoo instrument, while also monitoring and verifying the automated observations provided by the CIMEL sun photometer and the sky camera system. All measurements were conducted during EarthCARE satellite overpasses, with observations extending for at least two hours before and two hours after each overpass in order to ensure adequate temporal coverage and maximize the usefulness of the ground-based data for satellite validation activities, as long as atmospheric conditions were preferable.

Following the field measurements, I gathered, organized, and quality-checked the datasets produced by the different instruments. The processed data were then uploaded to a dedicated cloud server established for the campaign to facilitate data exchange and collaborative analysis among the participating research teams. In addition, I applied corrections to the Calitoo measurements based on the calibration effort performed during the previous year, ensuring improved consistency and reliability of the dataset.

The work carried out during the virtual mobility followed the initial working plan, focusing on the acquisition of high-quality atmospheric observations and the preparation of harmonized datasets for the EarthCARE campaign. No major deviations from the planned activities occurred, with the exception of one instrument malfunctioning during the overpass.

Table 1 provides a detailed list of all instruments participating in the study for each of the five dates selected for the validation campaign.

Date	LIDAR	CIMEL	Calitoo	SVC	Sky camera
10/04/2026	✓	×	×	×	✓
05/05/2026	✓	×	✓	✓	✓
30/05/2026	✓	✓	×	✓	✓
24/06/2026	✓	✓	×	✓	✓
19/07/2026	✓	✓	×	×	✓

Table 1. Instruments used during the EarthCARE validation campaign and their measurement availability for each selected overpass date.

The lidar system operated properly during all selected dates. The CIMEL sun photometer was absent from the laboratory on 10 April and 5 May due to calibration activities. In addition, during the overpass on 24 June, AERONET provided only Level 1 data because of a malfunction related to a cable that affected the instrument's movement. The SVC spectroradiometer performed measurements whenever it was available in Thessaloniki. Finally, the Calitoo handheld photometer was used once while the CIMEL instrument was

Description of the VM main achievements and planned follow-up activities

The virtual mobility achieved its planned objectives and provided a valuable contribution to the EarthCARE validation effort. The scheduled measurements were successfully completed, and the resulting datasets have already been organized and made available for scientific use. The collected observations can be directly incorporated into the ongoing validation activities and support the comparison between ground-based measurements and EarthCARE satellite products.

The campaign also strengthened the coordination between the participating research teams through the shared use of the dedicated cloud platform and the harmonization of the acquired datasets. The quality-controlled measurements constitute an important deliverable of the virtual mobility and provide a reliable basis for subsequent analysis.

As a follow-up activity, the collaboration will continue with the processing and interpretation of the collected data, the evaluation of EarthCARE retrievals against the ground-based observations, and the preparation of scientific results that may contribute to future publications related to the validation campaign. Further cooperation among the involved institutions is planned in order to maximize the scientific exploitation of the measurements and support future EarthCARE-related studies.