

Report on the outcomes of a Virtual Mobility¹

Action number: CA21119

Grantee name: Pablo González Sicilia

Virtual Mobility Details

Title: Drafting and preparation of Deliverable D4.2: Report on Hardware and Software Evolution Needs Based on WG3 Results.

Description of the work carried out during the VM

Description of the virtual collaboration and activities carried out during the VM, with focus on the work carried out by the grantee. Any deviations from the initial working plan shall also be described in this section.

The primary objective of this Virtual Mobility (VM) grant was to structure, and draft the Deliverable 4.2 of Working Group 4 (WG4) within the HARMONIA COST Action, titled "*Report on Hardware and Software Evolution Needs Based on WG3 Results.*" To achieve this, a comprehensive synthesis through Working Group 3 (WG3) and WG4 results was made, starting with a review of the key findings, user communities, and observational requirements identified in the WG3 deliverable "*Report on Aerosol Measurement Requirements for Different User Communities.*" The findings on this review were then mapped against the outcomes of the two WG4 workshops, establishing links between end-user needs and the necessary evolutions of both hardware and software to meet these requirements. Building on this, the structure of Deliverable 4.2 was drafted. The document begins with dedicated sections for each target community, detailing their operational and scientific requirements linking them with both, HARMONIA related scientific publications, and WG3 workshop findings. The deliverable then consolidates through cross-community software and hardware priorities, highlighting a targeted list of "Highest-Priority Investments." Furthermore, the report presents a tiered "measurement ecosystem" framework, detailing how instruments with varying accuracy levels and operational constraints can be synergistically integrated to address complementary observational strengths and satisfy broad user demands. The deliverable concludes with an evaluation of current observational gaps, key technological challenges, recommendations, a synthesis table of user requirements, and dedicated appendices summarizing the discussions from both WG4 workshops. All planned activities, spanning requirements synthesis, structure definition, and initial drafting, were successfully completed within the grant period, delivering a draft of the Deliverable 4.2 for final review.

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 VM main achievements and planned follow-up activities

Description and assessment of whether the VM achieved its planned goals and expected outcomes, including specific contribution to Action objective and deliverables, or publications resulting from the VM. Agreed plans for future follow-up collaborations shall also be described in this section.

This VM grant successfully achieved all of its planned goals and expected outcomes, directly contributing to the core scientific objectives of the HARMONIA COST Action. The main output of the grant was the successful delivery of a comprehensive, and mature draft of Deliverable 4.2: *“Report on Hardware and Software Evolution Needs Based on WG3 Results.”* By bridging the observational requirements defined by WG3 with the outcomes of the WG4 workshops and HARMONIA-related scientific publications, this work directly advances the Action’s intent to harmonize ground-based photometer aerosol measurements while providing useful roadmaps for necessary hardware and software improvements mainly driven by end-user needs. Key achievements include the mapping of different user requirements from multiple communities, the formulation of a targeted strategic list of highest-priority investments in both hardware and software, and the conceptualization of a “measurement ecosystem” framework designed to integrate complementary instrumentation, mitigating observational gaps, and leveraging the specific operational strengths of diverse types of instrumentation. As the HARMONIA COST Action approaches its final phase, the immediate follow-up collaboration will focus on coordinating and collaborating with the WG4 leaders to improve the draft, address the final review comments, and ensure the successful formal submission of Deliverable 4.2. Looking beyond the conclusion of the Action, this deliverable is designed to serve as a long-term reference and strategic roadmap for research infrastructures, instrument developers and manufacturers, and network operators across both the atmospheric aerosol and related communities.