

EGU23-16530, updated on 25 Apr 2024

<https://doi.org/10.5194/egusphere-egu23-16530>

EGU General Assembly 2023

© Author(s) 2024. This work is distributed under the Creative Commons Attribution 4.0 License.



ASKOS Campaign 2021/2022: Overview of measurements and applications

Eleni Marinou¹, Vassilis Amiridis¹, Peristera Paschou¹, Ioanna Tsikoudi¹, Alexandra Tsekeri¹, Vassiliki Daskalopoulou¹, Holger Baars², Athina Floutsis², Dimitra Kouklaki³, Razvan Pirloaga⁴, Franco Marengo⁵, Maria Kazoudi⁵, Ewan O Connor⁶, Lukas Pfitzenmaier⁷, Cordula Zenk⁸, Claire Ryder⁹, Jonas Von Bismarck¹⁰, Thorsten Fehr¹¹, and the ASKOS team*

¹National Observatory of Athens (NOA), Athens, Greece

²Leibniz Institute for Tropospheric Research (TROPOS), Leipzig, Germany

³University of Athens, Athens, Greece

⁴National Institute of Research & Development for Optoelectronics (INOE), Magurele, Romania

⁵The Cyprus Institute, Nicosia, Cyprus

⁶Finnish Meteorological Institute, Helsinki, Finland.

⁷University of Cologne, Cologne, Germany

⁸GEOMAR Helmholtz Centre for Ocean Research Kiel, Germany

⁹University of Reading, Reading, UK

¹⁰European Space Agency (ESA/ESRIN), Italy

¹¹European Space Agency (ESA/ESTEC), The Netherlands

*A full list of authors appears at the end of the abstract

In the framework of the Joint Aeolus Tropical Atlantic Campaign (JATAC), the ASKOS experiment was implemented in Cabo Verde during summer and autumn of 2021 and 2022. The main objective of ASKOS was the collection of an unprecedented dataset of synergistic measurements in the region, to be used to address a wide range of scientific objectives, namely the support of the validation of Aeolus mission's products, the study of the processes affecting desert dust transport (water vapor, giant particles, mixing with boundary layer dynamics), the characterization of the cloud microphysics, the effect of dust particles in the cloud formation over the region, the effect of the large dust particles on radiation and others.

During the ASKOS experiment, intense ground-based remote sensing and airborne in situ measurements took place on and above Mindelo on the island of São Vicente, Cabo Verde. At the Ocean Science Center in Mindelo (OSCM), a full ACTRIS remote sensing super site was set up in 2021, including a multiwavelength-Raman-polarization lidar PollyXT, an AERONET sun photometer, a Scanning Doppler wind lidar, a microwave radiometer and a cloud radar belonging to ESA fiducial reference network (FRM4Radar). Additionally, the ESA's reference lidar system eVe, a combined linear/circular polarization lidar with Raman capabilities, was deployed. In 2022, the operations were enhanced with the deployment of airborne in-situ aerosol measurements on-board UAVs deployed by the Cyprus Institute, solar radiation measurements supported by

PMOD/WRC, dust particle orientation measurements from the WALL-E lidar of National Observatory of Athens, and radiosonde releases equipped with additional electric field and electric charge measurements. The campaign was supported by dedicated numerical weather and dust simulations from CAMS and ECMWF, and tailored WRF simulations with nested domains above the campaign site.

From the ASKOS dataset, three cases have been selected as "golden cases" where multiple JATAC airborne platforms and Aeolus satellite performed collocated measurements alongside with the ground-based instrumentation around the ASKOS operations site. Furthermore, multiple synergistic measurements with the JATAC airborne platforms were performed in the broader Cabo Verde region. Here, we quickly introduce ASKOS measurements and present first results.

ASKOS team: Eleni Marinou (1), Vassilis Amiridis (1), Peristera Paschou (1), Ioanna Tsikoudi (1), Alexandra Tsekeri (1), Vassiliki Daskalopoulou (1), Spyros Metallinos (1), Nikos Siomos (1), Vassilis Spanakis (1), Sotiris Mallios (1), Anna Kampouri (1), Eleni Drakaki (1), Thanasis Georgiou (1), Antonis Gkikas (1), Proestakis Emmanouil (1), Panos Rapis (1), Pavlos Kollias (1), Ioanna Mavropoulou (1), Stavroula Papatheochari (1), Holger Baars (2), Athina Floutsi (2), Dimitri Trapon (2), Ronny Engelmann (2), Annett Scupin (2), Sofia Gómez Maqueo Anaya (2), Martin Radenz (2), Johannes Bühl (2), Julian Hofer (2), Patric Seifert (2), Birgit Heese (2), Dietrich Althausen (2), Ulla Wandinger (2), Stelios Kazadzis (3), Dimitra Kouklaki (4), Razvan Pirloaga (5), Anca Nemuc (5), Bogdan Antonescu (5), Doina Nicolae (5), Franco Marengo (6), Maria Kezoudi (6), Alkistis Papetta (6), Christos Keleshis (6), Jean Sciare (6), Ewan O' Connor (7), Konrad Kandler (8), Lukas Pfizenmaier (9), Cordula Zenk (10,11), Elizandro Rodrigues (11), Silva Eder (11), Pericles Silva (11), Ivanice Monteiro (11), Samira Moussa Idrissa (12), Daniel Tetteh Quaye (12), Desire Degbe Fiogbe Attannon (12), Corrine Almeida (12), Claire Ryder (13), Natalie Radcliffe (13), Jan-Berend Stuut (14), Sergio Rodrigues (15), Joseph Ulanowski (16), Josef Gasteiger (17), Volker Freudenthaler (18), Luke Jones (19), Angela Benedetti (19), Jonas Von Bismarck (20), and Thorsten Fehr (21). Affiliations: (1) IAASARS, National Observatory of Athens, Athens, Greece; (2) Leibniz Institute for Tropospheric Research, Leipzig, Germany; (3) Physics and Meteorology Observatorium of Davos, World Radiation Center (PMOD/WRC), Davos, Switzerland; (4) University of Athens, Athens, Greece; (5) National Institute of R&D for Optoelectronics, Bucharest, Romanian; (6) The Cyprus Institute, Nicosia, Cyprus; (7) Finnish Meteorological Institute, Helsinki, Finland; (8) Technische Universität Darmstadt, Germany; (9) University of Cologne, Cologne, Germany; (10) GEOMAR Helmholtz Centre for Ocean Research Kiel, Germany; (11) Ocean Science Centre Mindelo (OSCM), Mindelo, Cabo Verde; (12) Atlantic Technical University, Sao Vicente, Cabo Verde; (13) University of Reading, Reading, UK; (14) Royal Netherlands Institute for Sea Research, The Netherlands; (15) Consejo Superior de Investigaciones Científicas, Spain; (16) University of Hertfordshire, Hertfordshire, United Kingdom; (17) University of Vienna, Vienna, Austria; (18) Ludwig Maximilian University of Munich, Munich, Germany; (19) European Centre for Medium-Range Weather Forecasts, Reading, Great Britain; (20) European Space Agency (ESA/ESRIN), Italy; (21) European Space Agency (ESA/ESTEC), The Netherlands.