



The A-LIFE field experiment in the Eastern Mediterranean – Overview and early results

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In spring 2017, the A-LIFE aircraft field experiment (Absorbing aerosol layers in a changing climate: aging, lifetime and dynamics; www.a-life.at) was conducted in the Eastern Mediterranean. The overall aim of the ERC-funded A-LIFE project is to investigate the properties of absorbing aerosols (in particular mineral dust – black carbon mixtures) and to study potential links between the presence of absorbing particles, aerosol layer lifetime and removal. The campaign was performed in close coordination with the 18-month field observations conducted in the framework of CyCARE (Cyprus Clouds, Aerosol, and Rain Experiment, October 2016 – March 2018).

For A-LIFE, the German Aerospace Center (DLR) research aircraft Falcon was equipped with an extensive in-situ aerosol payload, a wind lidar and meteorological sensors. Between 3 and 29 April 2017, the Falcon was based in Cyprus and carried out measurements of the entire atmospheric column from the ground up to 12 km in the Mediterranean. The airborne measurements were complemented by ground-based in-situ and remote sensing observations in the region.

Altogether, 22 research flights were conducted and several Saharan dust outbreaks, Arabian and Middle East dust, pollution, and dust-impacted clouds were studied. During several flights, coordinated observations including overflights of ground-based sites in Cyprus (Limassol, Pafos, Agia Marina), Crete (Finokalia), and over Austria (Sonnblick Observatory, Vienna) were performed.

Highlights during A-LIFE include a sequence of six flights between 19 and 22 April 2017 which studied a Saharan dust outbreak and dust-impacted clouds between Malta, Crete and Cyprus as it moved eastwards across the Mediterranean. The event was also captured by the ground-based lidars and the in-situ instrumentation. Another highlight is a sequence of four flights between 26 and 29 April 2017 which investigated Arabian/Middle East dust at altitudes below 4 km and Saharan dust aloft. In most cases, a strong vertical layering of different aerosol types was observed. An interesting observation during the measurements in the Eastern Mediterranean was that the dust extended up to altitudes above 9-11 km very frequently.

In our presentation, we will give an overview of the A-LIFE study, show early results covering profiles of dust microphysical and optical properties, and discuss similarities and differences between Saharan and Arabian/Middle East dust. We will also compare the A-LIFE observations with results from other dust field experiments over Africa, Cape Verde and in the Caribbean.