



## **The Mediterranean aerosol scientific research : history and recent progress from ChArMEx**

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This presentation is focused on the tropospheric aerosol in the Mediterranean region. The Mediterranean basin is situated at the interface between contrasted regions of three continents (southern Europe, northern Africa and the Middle East), and is bordered by as many as 21 countries with densely populated coastal regions. As a consequence, the aerosol over the basin is strongly impacted by long-range transport from a variety of continental sources. In addition, the long and dry Mediterranean summer seasons favours aerosol accumulation so that background particle concentrations are often larger over the basin than over most of continental Europe. In particular, desert dust dominates the total mass of aerosol particles over the basin, whereas the fine particle fraction is dominated by sulphate in the eastern basin and organics in the western part.

A brief history of tropospheric aerosol studies in the region based on an extensive literature review extending up to 2011 is given, starting with desert dust observations in Israel in the late 1960's. Developments of field campaigns including research vessels and research aircraft, in situ background monitoring station, remote sensing and modelling are listed, and associated improvements in our knowledge of the regional aerosol are illustrated.

From 2012 on, the focus is put on highlights from the strong experimental and modelling effort undertaken as part of the Chemistry Aerosol Mediterranean Experiment (ChArMEx), a federated multilateral project to explore the atmospheric environment and its impacts on air quality, regional climate and marine biogeochemistry. In particular, five summer airborne campaigns including research aircraft and long-range drifting balloons for two of them, were performed in 2012, 2013 and 2014, and a shipborne campaign in late spring 2017. Work packages on emissions and sources, chemical processes and ageing, aerosol-radiation interactions, aerosol deposition, variability and trends, and future evolution have brought many new results (see also respective work package overview presentations in the same session). Many ChArMEx-related results can be found in a special issue ([https://www.atmos-chem-phys.net/special\\_issue334.html](https://www.atmos-chem-phys.net/special_issue334.html)) and a large database is available upon user registration (<http://mistrals.sedoo.fr/ChArMEx/>).