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The GLAM airborne campaign across the Mediterranean Basin

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The GLAM (Gradient in Longitude of Atmospheric constituents above the Mediterranean basin) airborne campaign was set up to investigate the summertime variability of gaseous pollutants, greenhouse gases and aerosols between the western (∼3°E) and eastern (∼35°E) sections of the Mediterranean Basin, as well as how this connects with the impact of the Asian monsoon anticyclone on the eastern Mediterranean in the mid-to-upper troposphere (∼5-10 km). GLAM falls within the framework of the Chemistry-Aerosol Mediterranean Experiment (ChArMEx) program. GLAM used the French Falcon-20 research aircraft to measure aerosols, humidity and chemical compounds: ozone, carbon monoxide, methane and carbon dioxide. GLAM took place between August 6 and 10, 2014, following a route from Toulouse (France) to Larnaca (Cyprus) and back again, via Minorca (Spain), Lampedusa (Italy) and Heraklion (Crete, Greece). The aircraft flew at an altitude of 5 km on its outbound journey and 10 km on the return leg. GLAM also collected vertical profiles around the landing sites listed above. A combination of model outputs, chemical mapping analyses, and space-borne and surface station measurements gathered prior to and during the campaign were used to interpret the in situ airborne measurements. The main outcome of this study is the impact of intercontinental transport on the longitudinal variability of pollutants, greenhouse gases and aerosols at an altitude of 10 km. The eastern Mediterranean is affected by air masses from the Arabian Sea surface, and the western Mediterranean is impacted by air masses from North America (biomass burning) and West Africa (desert dust).