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Vertical ozone measurements in the troposphere over the Eastern Mediterranean and comparison with Central Europe

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Abstract. Vertical ozone profiles measured in the period 1996–2002 in the framework of the MOZAIC project (Measurement of Ozone and Water Vapor by Airbus in Service Aircraft) for flights connecting Central Europe to the Eastern Mediterranean basin (Heraklion, Rhodes, Antalya) were analysed in order to evaluate the high rural ozone levels recorded in the Mediterranean area during summertime. The 77 flights during summer (JJAS) showed substantially (10–12 ppb, 20–40%) enhanced ozone mixing ratios in the lower troposphere over the Eastern Mediterranean frequently exceeding the 60 ppb, 8-h EU air quality standard, whereas ozone between 700 hPa and 400 hPa was only slightly (3–5 ppb, 5–10%) higher than over Central Europe. Analysis of composite weather maps for the high and low ozone cases, as well as back-trajectories and vertical profiles of carbon monoxide, suggest that the main factor leading to high tropospheric ozone values in the area is anticyclonic influence, in combination with a persistent northerly flow in the lower troposphere during summertime over the Aegean. On the other hand the lowest ozone levels are associated with low-pressure systems, especially the extension of the Middle East low over the Eastern Mediterranean area.

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