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Chemical characteristics assigned to trajectory clusters during the MINOS campaign

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Abstract. During the Mediterranean Intensive Oxidant Study (MINOS) in August 2001 a total of 14 measurement flights were performed with the DLR Falcon jet aircraft from Heraklion, Crete. One objective of this campaign was to investigate the role of long-range transport of pollutants into the Mediterranean area. An analysis of 5-day back trajectories indicates that in the lower troposphere (0-4 km) air masses originated from eastern and western Europe, in the mid-troposphere (4-8 km) from the North Atlantic Ocean region and in the upper troposphere (8-14 km) from North Atlantic Ocean/North America (NANA) as well as South Asia. We allocated all back trajectories to clusters based on their ending height and source region. The mixing ratios of ozone, nitrogen oxide, total reactive oxidized nitrogen (NO_x), formaldehyde, methanol, acetonitrile, acetone, peroxyacetyl nitrate (PAN), carbon dioxide, carbon monoxide and methane measured along the flight tracks are examined in relation to the different cluster trajectories. In the lower troposphere the mean trace gas mixing ratios of the eastern Europe cluster trajectories were significantly higher than those from western Europe. In the upper troposphere air from the NANA region seems to be influenced by the stratosphere, in addition, air masses were transported from South Asia, being influenced by strong convection in the Indian monsoon.

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