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# Analysis of the tropospheric ozone layering observed by Lidar during the ESCOMPTE campaign.

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We present an attempt to evaluate the respective contribution of the different vertical transport pathways to the observed tropospheric ozone variability. By diagnosing the origin of the layers with anomalous ozone content, we could quantify the overall net impact of each process on the ozone budget.

The ground based tropospheric ozone ALTO lidar was operated during the ESCOMPTE campaign in June and July 2001 over the Marseille area (South-eastern France). Quasi-continuous measurements of ozone during intensive observing periods provide an insight of the complex ozone stratification in the first 5km of the troposphere.

A comprehensive meteorological analysis is conducted to document processes responsible for this layering. This study relies on global scale meteorological analyses, non-hydrostatic meso-scale modelling using the Meso-NH tool, surface air pollution fields according to Chimere as well as trajectographic and plume dispersion computations. Even though the measurement site is located in an area highly exposed to local pollution episodes, long range transport is found to have a major impact on the free tropospheric ozone field. A wide range of vertical transport phenomena processes play a role including synoptic scale airstreams accompanying baroclinic wave breaking (warm conveyor belts, cold conveyor belts and dry intrusions) as well as meso-scale convective and thermal updrafts.