



## **The impact of vertical transport on free troposphere composition during ESCOMPTE field experiment, IOP2. MC2-AQ model simulations.**

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The ESCOMPTE program was undertaken in order to assemble validation data for numerical models of pollutant transport and chemical transformation. The campaign took place in southern France around Marseilles, between 4th of June and 16th of July 2001. During this period, four photochemical episodes (“Intensive Observing Periods”, IOPs) were documented. Observations were taken from an aircraft, a ferry, constant density balloons, remote sensing and surface stations. Measurements taken by lidars, radio-soundings and balloons have shown a very complex vertical structure of the atmosphere chemical composition. Additional analysis of meteorological measurements indicate that during IOP2 vertical transport processes played an important role in distribution of chemical species within the free troposphere.

MC2-AQ model simulations have been undertaken for selected IOP’s. MC2-AQ is a non-hydrostatic, fully compressible meteorological model with an on-line air quality module. The model is highly flexible and can be adapted to different spatial and temporal scales. MC2-AQ model domain was centred over southern France with 151x151 grid points and horizontal resolution of ~3km. In vertical, model grid extended up to 20000 km, with 35 staggered vertical layers.

We will show model results for IOP2, indicating vertical transport of ozone from the upper troposphere and (IOP2a) and interactions between PBL and the free troposphere (IOP2b). To evaluate MC2-AQ model, comparison of modelled and measured values of trace species concentration and meteorological parameters has been undertaken.