Vertical profiles obtained by balloon measurements during MILAGRO

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Abstract

Vertical profiles of ozone and 13 volatile organic compounds (VOCs), as well as meteorological parameters were measured with a tethered balloon during March 2006 at T0 site. Ozone and meteorological parameters were measured up to 1000 m above ground level, whereas VOCs were measured up to 200 m.

As well, wind speed and direction were determined during the same period with pilot balloons at Tenango and Ciudadd Universitaria. On this poster, only results from Tenango are reported. Wind field data up to 8000 meters were obtained at six times during the day with a vertical resolution of approximately 40 m.

The purpose of these studies was to contribute to the knowledge on air pollutant formation and transport at different layers of the atmosphere.

Ozone vertical profiles measured in the early morning frequently presented high concentrations above 400 m height. During the daytime, more homogeneous profiles indicate an increased vertical mixing. The vertical profiles of VOCs show highest concentrations in the morning at all measured heights. The principal VOCs were propane, toluene and propylene. The wind fields at above T0 indicate great variability, however, with relatively frequent flow from the Southwest..

The wind fields at Tenango indicate layers with different properties regarding transport. Data suggest a surface layer with flow predominantly in the North-South / South-North direction. An intermediate layer with varying directions is followed by a synoptically influenced layer with mainly southerly to westerly winds. Also a diurnal evolution of these layers is suggested.