Geophysical Research Abstracts, Vol. 8, 10260, 2006
SRef-ID: 1607-7962/gra/EGU06-A-10260

Ozone 3D measurements and modelling analysis: Strasbourg 2003 campaign

P. Ristori (1), O. Couach (2,3), F. Kirchner (3), I. Balin (3), V. Simeonov (1) and Hubert van den Bergh (1)

(1) Swiss Federal Institute of Technology, ENAC/ISTE/LPAS, CH 1015 Lausanne, Switzerland, (2) Swiss Federal Institute of Technology, ENAC/ISTE/EFLUM, CH 1015 Lausanne, Switzerland, (3) EnviroScopY SA (start-up project), PSE - EPFL, CH-1015 Lausanne, Switzerland (pablo.ristori@epfl.ch , Phone: +41 21 693 31 89)

The Upper Rhine Valley is subject every summer important of high concentrations of ozone. Particularly the city of Strasbourg located in the middle of Upper Rhine Valley is affected. This valley is surrounding by the Vosges mountains on the western, the Jura mountains on the southern and the Black Forest on eastern sides. During the summer 2003, an intensive measurements campaign with LIDAR and aircraft measurements has taken place over the whole valley. The period of investigation considered here is 4^{th} June 2003 and it corresponds to a photochemical ozone pollution episode i.e. 180 ug/m3 over 1 hour average. The vertical ozone profiles measured by LIDAR and simulated by model are considered for the north base location while the plane measurements are from different locations in the considered area. These different results demonstrate that the atmosphere up to 1500 m had an ozone concentration of 50-60 ppb. The LIDAR measurements show that the top of the mixing layer was nearly 1800 m at 14h00 UTC. The model results demonstrate a good correlation with the ozone concentration for the levels near the ground but underestimate the mixing of atmosphere. According to the aircraft results the ozone background is estimated at 40 ppb while the LIDAR and the model results show that the ozone level at 3000 m was about 50 ppb. During the 4^{th} June with a synoptic wind from the south, the local production of ozone is about 30 ppb. Considering 50 ppb for the model background concentration, this result shows that the large scale ozone transport is about 8 ppb and local production is 30 ppb. This result is in agreement with aircraft measurements that estimates a local production of 32 ppb for 4^{th} June with a minimum of 60 ppb and a

maximum of 92 ppb.

Keywords: lidar, aircraft, 3D mesoscale model, air pollution transport, photochemistry, ozone, planetary boundary layers dynamics