



The import-export balance of pollutants for the Po Valley hot spot

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The import/export of pollutants to and from hot-spots is an important issue for local communities, to define mitigation actions in order to limit air pollution. Moreover, the hot-spots role in the budget of atmospheric composition is a question of general interest.

A tracer study has been performed to shed some light on the problem.

Emissions modulated according to CO sources are marked differently in reference to points within (tracer “i”) or outside (tracer “o”) the selected areas (here, the Po Valley has been mainly used, and some comparisons with BeNeLux are made).

The mass of the tracers emitted inside and outside the selected area present on the air column above the same area is computed using BOLCHEM.

A one year run (using meteorology and emissions of 2007) has been performed over a European domain, with a resolution of 50 x 50 km.

The ratio of the mass of “i” over the mass of “o” in the entire column has a modal value of about 1, meaning that the contribution due to transport from remote sources becomes higher than the local one in half of the year. At the ground level (the lowest model level) the contribution to the total columnar mass from the local emission is larger than the remote (the average value of the ratio is about 3) but for about 15% of time the contribution from outside is larger than the local.

Since the Po Valley is mostly surrounded by high mountains, the advection at low levels is reduced and thus the local effects may be more important than in other areas. To get some comparison, a similar investigation has been performed for the BeNeLux hot spot. The qualitative results are very similar, despite the very different topographical features.

A careful investigation of the concentration patterns reveals local inhomogeneities. Therefore what has been noted to stand for the area averaged results is not necessarily true for each point. In this case it is evident that the air quality in areas inside the PoValley with relatively low emissions can be strongly affected by the long range transport of pollution.