



Interannual variability of air pollution in Northern Italy

E. Minguzzi (1), G.Bonafe' (1), M.Stortini (1), M.Deserti (1)

(1) Agenzia Regionale per la Prevenzione e l'Ambiente dell'Emilia Romagna
(eminguzzi@arpa.emr.it / +39051525936)

Po Valley is one of the most polluted, densely populated and heavily industrialized regions in Europe; high concentration of Ozone, PM10 and NO₂ are often observed, both in urban areas and in rural locations. Meteorological conditions strongly affect pollution levels, and this is particularly true in this area, where weak winds and low level inversions often occurs; furthermore, the occurrence of episodes of intense pollution and the seasonal variability of concentrations are both strongly affected by meteorological conditions. In this work, a 4 years simulation was performed with a Chemical Transport Model (Chimere), covering the period between April 2003 and March 2007. The meteorological input was provided by the limited area model COSMO-LAMI, run in continuous assimilation mode; emissions were taken from the Italian inventory (updated at year 2000), and were not changed from year to year. Model results were compared with observations and then used to assess the fulfillment of air quality standards. Exceedances of EU legislation thresholds were found to change significantly from year to year, and the relative contributions of meteorological variability and emission reduction policies have been discussed. The time interval chosen for the simulation includes a wide variety of meteorological conditions, including the very hot Summer 2003 and the very dry Winter 2006/2007: therefore the results of this work give useful information to assess the impact of climate change scenarios and seasonal forecasts on local air quality.