Interannual Variability of Tropospheric NO$_2$ Column over Central Europe – Observations from SCIAMACHY and GEM-AQ Model Simulations

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A b s t r a c t

Spatial and temporal variability of NO$_2$ tropospheric column over Europe was analyzed for a 3 year period (2008-2010) based on monthly average observations from SCIAMACHY and the GEM-AQ model results. The GEM-AQ model was run in a global variable configuration with a resolution of ~15 km over Central Europe. Spatial averaged time series were calculated for two selected regions in Western and Central Europe in order to assess the seasonal and interannual variability of the tropospheric NO$_2$. The spatial pattern is similar near large emission sources for consecutive years. However, in remote regions there are differences due to interannual variability of meteorological conditions. Highest tropospheric NO$_2$ column values (over 150×10^{15} molecules/cm^2) were persistent over the Benelux and over most of the European agglomerations. The general agreement between modelled and observed NO$_2$ column is good. In the remote areas, the modelled NO$_2$ column shows weaker gradients than the observed field.

Key words: SCIAMACHY, NO$_2$ column, GEM-AQ, Central Europe.