



Comparison of Tropospheric NO₂ Columns from the LOTOS-EUROS Regional Air Quality Model and Ground Based MAX-DOAS Observations

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It has been demonstrated that the MAX-DOAS measurement technique can be used to retrieve tropospheric NO₂ columns from ground based observations of scattered sunlight with an uncertainty below 20% (cloud free conditions). We have used a twelve-month data set (mostly 2008) of MAX-DOAS observations done in De Bilt, the Netherlands, to compare tropospheric NO₂ columns - seasonal variation, diurnal cycle, weekly cycle - with the regional air quality model LOTOS-EUROS that was run on a high-resolution grid (7x7 km²). A comparison with both a free model run, and a run including assimilated surface observations of NO_x and ozone, was performed to study the effect of data-assimilation. For cloudy conditions, only the sub-cloud tropospheric NO₂ columns were compared, using lidar cloud height observations in combination with the NO₂ profile from the LOTOS-EUROS model.