Satellite observations of tropospheric NO2 and H2O. Validation and comparison with model results

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In recent years satellite observations of various tropospheric pollutants and greenhouse gases have become available. They yield information on the global distributions of emission sources and atmospheric transport pathways. These observations have the potential to improve our knowledge on atmospheric processes on a global scale. Weaknesses of satellite observations are their limited sensitivity towards the surface, their relatively large uncertainties and their rather coarse spatial resolution. Thus their quantitative interpretation is not straight forward and requires both validation by independent data sets and comparison with the results of atmospheric model simulations.

We present observations of tropospheric water vapor and nitrogen dioxide (NO2) from the satellite instruments GOME and SCIAMACHY along with their validation by ground based and satellite observations. Both data sets are compared to atmospheric model simulations allowing to constrain the atmospheric hydroxyl radical concentration and the emission inventories of nitrogen oxides (NOx).