10 Years of Remote Sensing with modern UV/vis/NIR Satellite Instruments: A New View on Global Near-Surface Trace Gas Distributions

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A new generation of UV/vis/NIR satellite instruments like GOME, SCIAMACHY and OMI allows for the first time to measure several important tropospheric trace gases like NO_2, HCHO, SO_2, BrO, and H_2O as well as properties of clouds and aerosols from space. Recently these data sets were completed with Greenhouse gases (CO_2, CH_4) and CO analysed in the near IR spectral range of SCIAMACHY.

The derived global data sets can yield a comprehensive view on the global tropospheric trace gas distributions. In particular they include remote regions, e.g. in polar regions or over the oceans. From satellite data it is thus possible to investigate the temporal and spatial variation and e.g. to separate chemical and dynamical effects. Also different sources can be characterised and quantified. The derived global distributions can serve as input and for the validation of current atmospheric models.

This presentation aims to give an overview on the current status of these new satellite instruments and data products and their recent applications to various atmospheric phenomena. Possible future instrumental and algorithmic improvements are outlined.