



Satellite remote sensing of trace gases and air quality using SCIAMACHY onboard ENVISAT

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The total volume mixing ratio of trace gases is approximately 0.1 percent for dry air. Although the total vertical columns of these gases are small, trace gases have a profound influence on atmospheric chemistry, pollution, and climate. Spectrometers on geostationary orbits will provide the required information on the atmospheric chemical composition with high temporal and spatial resolution necessary for the improvement of chemical atmospheric models and for forecasts of pollution, i.e. air quality. Present atmospheric chemistry missions operate from polar orbiting satellites. The purpose of this presentation is to give an overview of the state-of-art in the retrieval of total vertical columns of tropospheric trace gases from spaceborne observations. Most retrievals to be presented in the paper are based on the hyperspectral measurements of the SCanning Imaging Absorption SpectroMeter for Atmospheric CHartography (SCIAMACHY) onboard ENVISAT. The SCIAMACHY provides a wealth of information on the Earth's atmosphere. In particular, the retrieval of vertical columns of following trace gases will be discussed: CO, CO₂, CH₄, O₃, NO₂, SO₂, and H₂O. In addition, the technique to retrieve the particulate matter concentration using satellite measurements is described.