



Remote Sensing of Air Quality

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Message from the Guest Editors

Air quality is determined by atmospheric aerosols and trace gases, which have adverse effects on, e.g., health, visibility and climate. In particular, the near-surface concentrations of NO₂, SO₂, O₃, NH₃, Volatile Organic Compounds (VOCs) and aerosol properties, for air quality purposes often expressed as PM_{2.5} or PM₁₀, are important. The vertical column densities (VCDs) of trace gases and the column-integrated aerosol extinction coefficients (i.e., the aerosol optical depth, or AOD) can be determined from satellite observations, using the same method globally. However, to determine the near-surface concentrations and emissions of trace gases and aerosols (PM) requires the use of a model taking into account processes affecting the vertical profile. In addition, the determination of emissions of aerosols and trace gases requires inverse modeling in which the concentrations are constrained by satellite observations. This top-down approach allows for the determination of near surface concentrations and emissions with high temporal resolution and reveals emission and concentration changes on very short time scales (~1 month).





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