



New methods for the calibration of colour indices and O₄ absorptions obtained from MAX-DOAS measurements

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So called colour indices (CI) are defined as ratio of radiances at different wavelengths. CI measurements from Multi-AXis-Differential Absorption Spectroscopy (MAX-DOAS) observations are important for the detection and classification of clouds and aerosols. However, usually, MAX-DOAS instruments are not radiometrically calibrated. Thus the measured CI can not be directly compared to results from radiative transfer simulations. This shortcoming prevents the standardisation of cloud classification schemes.

In addition to the CI, also the absorption of the oxygen dimer (O₄) can be used for cloud detection, in particular for the detection of optically thick clouds or fog. However, also the retrieved O₄ absorption has first to be calibrated (the absorption of the Fraunhofer reference spectrum has to be determined) before it can be used in a standardised way.

We developed methods for the calibration of the CI and the O₄ absorption derived from MAX-DOAS observations. They are based on the comparison of measurements and simulation results for well-defined atmospheric conditions. We estimate the accuracy of our calibration methods to < 10%.