



Emission Ratios from satellite measurements

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The spectra of reflected and backscattered solar radiation as measured by SCIAMACHY in nadir observation mode in the UV/visible/near-infrared/short-wave-infrared spectral region contain information on the vertical columns of numerous air pollutants and offer a large-scale perspective on large and uncertain pollution sources such as biomass burning. In this presentation it will be shown that under a number of reasonable assumptions, emission ratios (ER), used often for emission modelling by applying the Carbon Balance Method (CBM), can be obtained from the SCIAMACHY satellite simultaneous measurements of carbon monoxide (CO), taken as a reference carbon component, formaldehyde (HCHO) and nitrogen dioxide (NO₂) columns. Using a well established technique, we calculate the emission ratios, $\Delta\text{CO}/\Delta\text{HCHO}$ and $\Delta\text{CO}/\Delta\text{NO}_2$, over eight large biomass burning events in 2004 (recognized with the help of the AATSR fire counts product). We show that the calculated ER values are in a reasonable agreement with the values obtained locally over similar biomass burning events in the past as reported in the literature. The latter agreement indicates potential value of satellite trace gases products for emissions estimations by using the CBM method. In addition, we present the techniques for integration of the obtained satellite emission ratios into the coupled ECHAM5/JSBACH (land-atmospheric general circulation) model and give a certain perspective for further emissions modelling by using the selected model-measurements combination.