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Global atmospheric carbon gases retrieved from SCIAMACHY/ENVISAT by WFM-DOAS: Methane, carbon dioxide and carbon monoxide

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The near-infrared nadir spectra of reflected solar radiation measured by SCIAMACHY on-board ENVISAT contain information on the vertical columns of important atmospheric carbon gases such as the greenhouse gases methane (CH4) and carbon dioxide (CO2) and the air pollutant carbon monoxide (CO). The scientific algorithm WFM-DOAS has been used to retrieve this information. For CH4 and CO2 dry air column averaged mixing ratios have been determined by simultaneous measurements of the dry air mass obtained from, e.g., oxygen (O2). For CO we retrieve absolute vertical columns. The SCIAMACHY data set is unique because of the high sensitivity of the near-infrared measurements with respect to concentration changes in the atmospheric boundary layer. This sensitivity is a pre-requisite to get information on regional surface sources and sinks which are currently only poorly constrained globally by atmospheric measurements. The retrieval is a challenging task, e.g., due to the high precision and accuracy requirements for the greenhouse gases. We present the current status of this activity including comparisons with local (ground based FTS) and global (models, MOPITT) reference data.