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Methane and carbon dioxide column-averaged mixing ratios from SCIAMACHY on ENVISAT

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Methane (CH4) and carbon dioxide (CO2) are the two most important anthropogenic greenhouse gases and contribute to global climate change. The spectral measurements of reflected and backscattered solar radiation in the near-infrared spectral region of the SCIAMACHY instrument onboard ENVISAT enable the retrieval of column-averaged mixing ratios of both gases with high sensitivity for concentration changes near the Earth's surface where the source/sink signals are largest. At the University of Bremen the scientific algorithm WFM-DOAS has been developed to retrieve this information from the measured spectra. Several years of global data have been processed until now (focus: 2003-2005) using the latest version of WFM-DOAS (version 1.0). The analysis of the resulting greenhouse gas data sets is an ongoing activity. For CO2 detailed comparisons have been performed with the global CO2 fields of NOAA's CO2 assimilation system CarbonTracker. Overall, reasonable to good agreement has been found but also interesting differences. For example, the satellite retrievals show an amplitude of the seasonal cycle of the colunm-averaged CO2 mixing ratio over the northern hemisphere, which is significantly (about 40 percent) larger compared to CarbonTracker. This may be due to still to be resolved retrieval issues but this may also indicate that CarbonTracker (as well as other models) significantly underestimates the seasonal amplitude of the northern hemispheric terrestrial carbon fluxes. Also for methane, the analysis of the existing data set is an ongoing activity. Recently the methane data have been reprocessed to assess the impact of newly available spectroscopic input parameters. Initial analysis confirms the findings of Frankenberg et al., 2008, of previously overestimated tropical methane due to interference with water vapor absorption lines. In the presentation an overview about the current status of the greenhouse gas retrievals from SCIAMACHY spectra will be given.