Geophysical Research Abstracts
Vol. 12, EGU2010-2346-2, 2010
EGU General Assembly 2010

Sensitivity of SCIAMACHY XCO_2 to Aerosols and Cirrus Clouds

Jens Heymann, Maximilian Reuter, Oliver Schneising, Michael Buchwitz, Heinrich Bovensmann, and John P. Burrows

University of Bremen, Institute of Environmental Physics, P.O.Box 330440, D-28334 Bremen, Germany (heymann@iup.physik.uni-bremen.de)

Carbon dioxide (CO_2) is one of the most important greenhouse gases. Since pre-industrial times the CO_2 concentration has increased by more then 36%. The growth of CO_2 concentration results in a global warming and thereby in rising sea levels and extrem weather conditions. In this context, a good understanding of the sources and sinks of CO_2 is a pre-requisite for reliably predicting the future climate. Satellite instruments such as SCIAMACHY onboard ENVISAT can add important missing global information on regional CO_2 sources and sinks as gound-based or aircraft observations are sparse. This however requires a precision and accuracy of 1% or better. Especially biases, i.e., systematic errors, need to be avoided. Two potential error sources are aerosols and cirrus clouds. Here we present first results from a detailed analysis of three years of SCIAMACHY XCO_2, i.e., of the column-averaged mixing ratio of CO_2, with respect to possible retrieval errors caused by aerosols and thin clouds. In a first step, we have analyzed to what extent the differences between SCIAMACHY XCO_2 and global model data are correlated with aerosol optical thickness data sets as generated by the European GEMS project and using one year of CALIPSO cirrus optical thickness. In a second step, we perform simulations to investigate if the observed correlations can be reproduced using retrievals based on simulated radiances.