Geophysical Research Abstracts
Vol. 15, EGU2013-2811, 2013
EGU General Assembly 2013

Carbon Monitoring Satellite (CarbonSat): Error analysis for XCO_2, XCH_4 and secondary products such as Vegetation Chlorophyll Fluorescence

Michael Buchwitz (1), Heinrich Bovensmann (1), Maximilian Reuter (1), Jens Heymann (1), Oliver Schneising (1), John P. Burrows (1), Hartmut Boesch (2), Yasjka Meijer (3), Bernd Sierk (3), Armin Löscher (3), and Paul Ingmann (3)

(1) University of Bremen, Institute of Environmental Physics / Remote Sensing, Bremen, Germany (michael.buchwitz@iup.physik.uni-bremen.de), (2) University of Leicester, Leicester, United Kingdom, (3) ESA ESTEC, Noordwijk, The Netherlands

CarbonSat is one of two candidate missions for ESA's Earth Explorer 8 (EE8) to be launched around 2019. Using the most recent instrument and mission specification, an error analysis has been performed using the latest versions of algorithms for retrieving CarbonSat's geophysical parameters. This comprises the definition of relevant geophysical scenarios, radiative transfer and instrument simulations to generate simulated radiance spectra as will be measured by CarbonSat, and the application of retrieval algorithms. Error analysis results have been obtained for the CarbonSat's primary products, which are the column-averaged dry air mole fractions of CO_2 and CH_4, denoted XCO_2 and XCH_4, but also for its secondary products such as Vegetation Chlorophyll Fluorescence. Random errors are primarily a result of instrument noise and are standard output of the retrieval algorithms. Systematic errors (biases) are determined by computing the difference between the retrieved value and the true value known from the model atmosphere. Biases are caused by a number of potentially important error sources such as undetected thin cirrus clouds, aerosols and residual errors from imperfect spectral and radiometric calibration. In this presentation results from a recent error analysis are presented focusing on nadir observations. First results for sun-glint observations over the ocean will also be presented.