Geophysical Research Abstracts
Vol. 17, EGU2015-1300, 2015
EGU General Assembly 2015

Satellite Observations of Carbon Dioxide and Methane: From SCIAMACHY to CarbonSat

Michael Buchwitz, Maximilian Reuter, Oliver Schneising, Michael Hilker, Thomas Krings, Dhanyalekshmi Pillai, Heinrich Bovensmann, and John P. Burrows

University of Bremen, Institute of Environmental Physics / Remote Sensing, Bremen, Germany (michael.buchwitz@iup.physik.uni-bremen.de)

SCIAMACHY on ENVISAT and TANSO-FTS onboard GOSAT are currently the only two satellite sensors which can be used to generate multi-year data sets of near-surface sensitive column-averaged dry-air mole fractions of carbon dioxide (CO_2) and methane (CH4), i.e. XCO_2 and XCH4. Within the GHG-CCI project of ESA's Climate Change Initiative (CCI, http://www.esa-ghg-cci.org/), XCO_2 and XCH4 data products from these sensors are generated, made available to all interested users and used to address important scientific questions related to the sources and sinks of these greenhouse gases (GHG). Among the retrieval algorithms are the WFM-DOAS and BESD algorithms developed at the University of Bremen. An overview about the GHG-CCI project and its data sets will be given and selected results related to scientific applications will be presented, where the data sets have been used to improve our knowledge on CO_2 and CH4 natural and anthropogenic sources and sinks. As will be explained, current sensors are not optimized to deliver information on localized emission hot spots of CO_2 and CH4. In order to be able to address these and other aspects better in the future, the University of Bremen has proposed the Carbon Monitoring Satellite (CarbonSat) to ESA in 2010. Currently CarbonSat is one of two candidate missions for ESA's Earth Explorer 8 satellite. A short overview about CarbonSat will also be given focusing on how CarbonSat will overcome limitations of existing GHG satellite missions.