Consistent satellite carbon dioxide retrievals for SCIAMACHY and GOSAT using the BESD algorithm

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Consistent and accurate long-term data sets of global atmospheric concentrations of carbon dioxide (CO_2) are needed for carbon cycle and climate related research. However, global long-term data sets based on satellite observations may suffer from inconsistencies originating from the use of products derived from different satellites. One reason for inconsistencies can be the use of different retrieval algorithms. This issue has been addressed by applying the same algorithm to observations of different satellite instruments. The Bremen Optimal Estimation DOAS (BESD) retrieval algorithm initially developed to retrieve the column-averaged dry-air mole fration of CO_2 (XCO_2) from observations of SCIAMACHY onboard ENVISAT has been modified to also retrieve XCO_2 from TANSO-FTS onboard GOSAT. The GOSAT BESD XCO_2 is a product generated and delivered to EU's Monitoring and Atmospheric Composition and Climate (MACC) project for assimilation into ECMWF's Integrated Forecasting System (IFS). An assessment of the GOSAT BESD XCO_2 data set using ground-based observations of XCO_2 from the Total Carbon Column Observing Network (TCCON) and an investigation concerning the consistency of the SCIAMACHY BESD and GOSAT BESD XCO_2 data sets has been performed. Here, results of these activities are presented.