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CarbonSat: Quantification of random and systematic errors of column-averaged CO_2 and methane retrievals

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The Carbon Monitoring Satellite (CarbonSat, http://www.iup.uni-bremen.de/carbonsat) has been selected by ESA end of 2010 to be one of two Earth Explorer Opportunity candidate missions (Earth Explorer 8, EE-8) to be launched around 2019. The main goal of CarbonSat is to deliver improved information on carbon dioxide (CO_2) and methane (CH_4) surface sources (emissions) and sinks as needed for better climate prediction and other applications such as greenhouse gas emission monitoring. For mission optimization and data quality estimation a retrieval algorithm called BESD is under development at University of Bremen, Germany. BESD is being optimized to accurately retrieve column-averaged mole fractions of CO_2 and CH4, XCO_2 and XCH_4, from the CarbonSat spectral observations. This algorithm is being used to quantify random and systematic XCO_2 and XCH_4 retrieval errors, e.g., due to thin cirrus, aerosols and terrestrial vegetation chlorophyll fluorescence. The current status of this ongoing activity will be presented focusing on XCO_2 and XCH_4 retrieval errors but also on the expected quality of interesting by-products such as vegetation chlorophyll fluorescence.