



Strategy for harmonized retrieval of column-averaged methane from the mid-infrared NDACC FTS-network and intercomparison with SCIAMACHY satellite data on global scale

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Global measurements of column-averaged methane have recently shown a step forward in data quality via year 2003 and 2004 retrievals from two different processors, namely IMAP-DOAS ver. 49 and WFM-DOAS ver. 1.0 (Frankenberg et al., 2008; Schneising et al., 2009). Accuracy and precision have approached the order of 1 %, and can be considered for inverse modelling of sources and sinks. This means at the same time that the quality requirements for ground-based validation data have become higher. In order to guarantee a station-to-station consistency of <1 % we performed a harmonization effort for 12 selected globally distributed mid-infrared FTIR stations of the Network of the Detection of Atmospheric Composition Change (NDACC). Station-to-station biases are eliminated by using identical micro-windows, spectroscopic line lists, retrieval parameters, sources of ancillary data like pressure-temperature profiles, and water vapor data for deriving dry air columns. Furthermore, a geophysically consistent set of prior information for the retrievals at all stations was established. A new altitude-correction scheme is presented which allows for inclusion of high-altitude ground-sites into the validation data set. Our network validation study utilizes the validation strategy developed during the first validation of SCIAMACHY column-averaged methane by FTIR (Sussmann et al., 2005). The outcome of the new study is the accurate determination of the satellite-ground station biases as a function of latitude on global scale.

References

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