Comparison of GOSAT XCH$_4$ and airborne measurements over Siberia

M. Yamamoto (1), S. Hayashida (1), A. Ono (1), T. Machida (2), and T. Sugita (2)
(1) Faculty of Science, Nara Women’s University, Japan
(2) National Institute of Environmental Studies, Tsukuba, Japan

The Greenhouse Gases Observing Satellite (GOSAT) was launched on 23 January 2009. In order to apply the GOSAT products to estimate CH$_4$ budget by inverse analysis, we need to confirm the quality of the GOSAT CH$_4$ data carefully. The result of validation of GOSAT XCH$_4$ (version 02.xx) by comparing them with TCCON XCH$_4$ is reported in “Summary of NIES the GOSAT Level 2 Data Product Validation Activity” as in Morino et al., [ACP, 2011]; GOSAT XCH$_4$ is biased low by 7.0 ± 12.0 ppb (0.4 ± 0.7%). However, all TCCON sites are located in background regions, and validation of GOSAT data over the source regions is insufficient. Under the NIES program, airborne measurements have been carried out in Surgut and Novosibirsk, Siberia, since 1993 [Umezawa et al., GBC, 2012]. We apply the aircraft measurements over Siberia to assess the quality of the GOSAT XCH$_4$ dataset obtained from SWIR band. Conversion of the CH$_4$ profiles observed by aircraft into XCH$_4$ includes some uncertainties such as temperature profiles and CH$_4$ distribution in the stratosphere. In this presentation we report the detailed result of sensitivity analysis for those uncertainties.

Research Topic: Application

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