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Validation of GOSAT methane by ground-based MIR- and NIR FTS at the Ground-Truthing Facility Garmisch/Zugspitze

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Continuous ground-based measurements are performed correlative to GOSAT overpasses in the near infrared (NIR) and mid-infrared (MIR) with the TCCON FTS at Garmisch (47.48 °N, 11.06 °E, 745 m a.s.l., NIR and MIR) and the nearby NDACC FTS at Zugspitze (47.4 °N, 11.0 °E, 2964 m a.s.l., MIR).

These data are used in this study to quantify potential biases and temporal drifts of GOSAT level-2 data on column-averaged methane. A focus is on investigation of time dependent biases which arise from airmass-dependent artifacts and impact XCH4 annual cycles on the 1 % level - which is comparable to the amplitude of the seasonal cycle for clean air sites. Therefore, the coincident ground-based MIR and NIR FTS operation is a key to assess residual airmass-dependent artifacts on the way to reach error levels significantly below 1 %. The ground-based FTS set up is described and first preliminary results are shown.

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