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Atmospheric
Measurement
Techniques
Discussions

Interactive comment on "Aircraft measurements of carbon dioxide and methane for the calibration of ground-based high-resolution Fourier Transform Spectrometers and a comparison to GOSAT data measured over Tsukuba and Moshiri" *by* T. Tanaka et al.

Anonymous Referee #3

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The authors present a manuscript describing aircraft measurements of CO2 and CH4 that were used for the calibration of two ground-based high-resolution FTIR instruments. In addition, they compare the aircraft and FTIR data with measurements performed by GOSAT.

The presented manuscript is well written, has a clear structure and fits good into AMT. The scientific content is interesting and important for the atmospheric remote sensing

community.

General comments:

Unfortunately, the authors do not present a section about the FTIR measurements and the instrumental parameters that were used.

Although the instruments took part in the calibration presented by Wunch et al. (2010), it would be useful if the authors could repeat some of the results (general calibration factor ↔ aircraft/FTS-ratio for the Japanese stations). As far as I understand, the data the authors contributed to the Wunch et al. Calibration are quite unique. The aircraft measurements have – compared to the others used in the calibration – very limited vertical coverage. Thus, they lack important information about the upper part of the atmosphere. The authors should point out and discuss resulting uncertainties in their comparison of aircraft, FTS, and satellite data.

Specific comments:

p1850, line 20: The authors mention the different topography of the Moshiri area. How does that influence the GOSAT data retrieval?

p1852, line 1: Why do the instruments not cover the HF region? I thought, HF is one of the species of the TCCON standard retrieval.

p1852, line 3: How good/bad is the determination of the tropopause height via radio sondes in comparison to the determination via CH4-HF-correlation?

p1854, line 16: It would be very helpful if the authors would present the Moshiri data in an additional figure. Why does the Moshiri-FTS run at 20kHz? Is that the only difference to the TCCON standard settings? Why is the pyranometer data not polled at a higher frequency to be more useful for the determination of FVSI? Can the lower SNR and the lack of FVSI really explain the large difference?

Tables 1-4: The aircraft data in tables 1 and 2, respectively 3 and 4, seems to be

inconsistent. A direct comparison of FTS and GOSAT data is missing.

Technical comments:

I believe the correct naming convention for X CO2 is X_subscribt(CO2).

Interactive comment on Atmos. Meas. Tech. Discuss., 5, 1843, 2012.