

Supplementary Materials: Intercomparison of XH₂O Data from the GOSAT TANSO-FTS (TIR and SWIR) and Ground-Based FTS Measurements: Impact of the Spatial Variability of XH₂O on the Intercomparison

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Table S1. Coordinates of TCCON sites and nearby radiosonde launch sites.

TCCON Sites (Lat (°), Lon (°), Alt. (m))	Radiosonde Sites (Lat (°), Lon (°), Alt. (m))	Differences between the TCCON and Radiosonde Sites	
		Horizontal Distances (km)	ΔAlt. (m)
Sodankylä (67.37, 26.63, 188)	Sodankylä (67.37, 26.65, 178)	0.9	10
Białystok (53.23, 23.03, 180)	Legionowo (52.40, 20.97, 96)	166.6	84
Karlsruhe (49.10, 8.44, 116)	Stuttgart (48.83, 9.20, 315)	63.2	−199
Orléans (47.97, 2.11, 130)	Trappes (48.77, 2.00, 168)	89.4	−38
Garmisch (47.48, 11.06, 740)	Altenstadt (47.83, 10.87, 738)	41.5	2
Park Falls (45.94, −90.27, 440)	Green Bay (44.48, −88.13, 214)	233.6	226
Four Corners (36.80, −108.48, 1643)	Grand Junction (39.12, −108.52, 1474)	258.3	169
Lamont (36.60, −97.49, 320)	Lamont (36.62, −97.48, 315)	2.4	5
Tsukuba (36.05, 140.12, 30)	Tateno (36.05, 140.13, 31)	0.9	−1
JPL (34.20, −118.18, 390)	Vandenberg AFB (34.75, −120.57, 100)	227.7	290
Saga (33.24, 130.29, 8)	Fukuoka (33.58, 130.38, 15)	38.8	−7
Darwin (−12.43, 130.89, 30)	Darwin (−12.43, 130.87, 29)	2.2	1
Wollongong (−34.41, 150.88, 30)	Williamstown (−32.82, 151.83, 9)	197.7	21
Lauder (−45.05, 169.68, 370)	Invercargill (−46.42, 168.32, 4)	185.5	366

Table S2. Rates of change of IWV with respect to height (% per 100 m) for each TCCON site.

TCCON Sites (Lat (°), Lon (°))	January	February	March	April	May	June	July	August	September	October	November	December
Sodankylä (67.37, 26.63)	3.8	3.9	4.3	4.1	3.9	3.7	3.8	4.0	4.2	4.0	4.0	4.1
Białystok (53.23, 23.03)	3.7	3.9	4.1	4.0	3.8	3.8	3.7	3.8	4.0	4.1	3.9	3.9
Karlsruhe (49.10, 8.44)	4.1	4.1	4.3	4.1	4.0	3.9	3.8	3.9	4.1	4.0	4.0	3.9
Orléans (47.97, 2.11)	4.3	4.3	4.5	4.2	4.1	4.0	3.9	3.9	4.1	4.1	4.2	4.2
Garmisch (47.48, 11.06)	4.1	4.1	4.5	4.3	4.1	4.0	4.0	4.0	4.3	4.2	4.2	4.0
Park Falls (45.94, −90.27)	3.3	3.6	3.6	3.3	3.7	3.8	3.9	4.1	4.1	3.7	3.7	3.6
Four Corners (36.80, −108.48)	3.7	4.2	3.9	3.7	3.5	3.2	3.2	3.4	3.5	3.7	4.0	3.8
Lamont (36.60, −97.49)	3.6	4.0	4.1	4.1	4.3	4.1	3.6	3.7	3.6	3.8	4.1	3.7
Tsukuba (36.05, 140.12)	4.2	3.6	3.6	4.0	3.9	3.6	3.5	3.6	3.6	3.6	4.0	3.9
JPL (34.20, −118.18)	3.9	4.5	4.5	4.5	4.4	4.2	3.7	4.0	4.0	4.4	4.5	4.2
Saga (33.24, 130.29)	4.2	3.6	3.6	3.8	3.7	3.5	3.5	3.4	3.6	3.9	3.9	4.1
Darwin (−12.43, 130.89)	3.6	3.7	3.7	3.9	3.8	4.1	4.0	4.8	4.6	4.2	4.0	3.7
Wollongong (−34.41, 150.88)	4.1	4.0	4.3	4.4	4.5	4.5	4.5	4.7	4.7	4.4	4.3	4.0
Lauder (−45.05, 169.68)	3.9	3.9	3.9	4.0	4.2	4.4	4.5	4.6	4.3	4.2	3.9	3.9

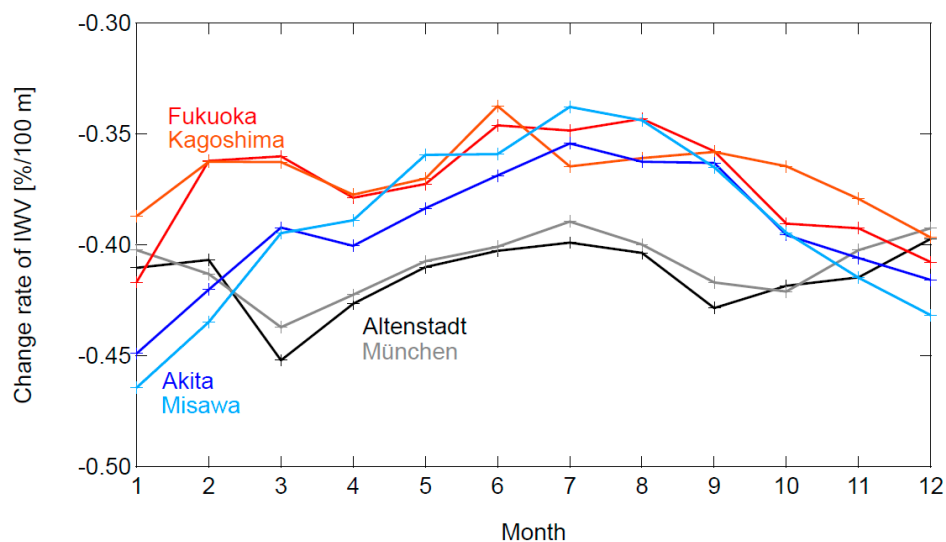


Figure S1. Rates of change of IWV with respect to height (% per 100 m) for relatively close radiosonde site pairs. The distances are 69 km for Altenstadt and München, 154 km for Akita and Misawa, and 218 km for Fukuoka and Kagoshima.



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