



CO₂ total column amounts at the TCCON sites Izaña (28.3 N, 16.5 W) and Karlsruhe (49.1 N, 8.5 E)

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The Total Carbon Observing Network (TCCON) is a global network of ground-based Fourier Transform Spectrometers recording direct solar spectra in the near-infrared spectral region. With stringent requirements on the instrumentation, data processing and calibration, accurate and precise column-averaged abundances of CO₂, CH₄, N₂O, HF, CO, H₂O, and HDO are retrieved. Achieving such high precision is essential for using the column-averaged data in carbon cycle research (Olsen and Randerson, 2004) and for satellite validation (e.g. SCIAMACHY, GOSAT, OCO. . .).

TCCON was established in 2004. Actually there are 19 sites affiliated around the world, Izaña being fully operational since May 2007 and Karlsruhe since September 2009. While Izaña is a subtropical high mountain observatory located at 2.4 km altitude over a temperature inversion layer acting as a natural barrier for local pollution, Karlsruhe is a continental site located at 110 m a.s.l. in a flat terrain.

The status of the TCCON activities performed at Karlsruhe Institute of Technology and Izaña Observatory will be presented. The official fitting algorithm is GFIT developed at NASA/JPL. In this presentation we will apply a different procedure for calculating the trace gas abundances from the measured spectra, the fitting algorithm PROFFIT (F. Hase, et. al., 2004). Ghost-corrected CO₂ total column amounts will be shown and the quality of the data will be documented. Furthermore, the column-averaged abundances of CO₂ will be compared with the simultaneously performed surface in-situ measurements for the Izaña Observatory.

References:

- Hase, F., et al., J.Q.S.R.T. 87, 25-52, 2004.
- Olsen, S.C. and Randerson, J.T., J.G.Res., 109, doi: 10.1029/2003JD003968.
- Toon, G. et al., J.G.Res., 97(D8), 7939-7961, doi:10.1029/91JD03114.