1.249 Calibration of column-averaged dry-air mole fractions of atmospheric CO2, CO and CH4 at the Burgos TCCON site in the Philippines.

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Abstract:

The Total Carbon Column Observing Network (TCCON) is a network dedicated to the precise remote sensing measurements of the column-averaged dry-air mole fractions (DMF) of CO_2, CO, CH_4, N_2O and H_2O. Column-averaged DMF of gases (denoted as X_G for gas G) can be used in combination with in situ measurements to disentangle the effects of atmospheric mixing and surface exchange of greenhouse gases, providing a

better understanding of the regional-scale fluxes. However, TCCON measurements rely on spectroscopic parameters that are not known with sufficient accuracy. TCCON measurements of X_G must therefore be calibrated to World Meteorological Organization (WMO) in situ trace gas measurement scales. Here, we present a calibration of the Burgos TCCON data using WMO-scale instrumentation aboard the HALO aircraft that measured profiles during its transfer flight in the scope of the EMeRGe-Asia mission. Measurements of X_{CO2}, X_{CH4} and X_{CO} with a portable spectrometer (Bruker EM27/SUN) were also made, coincident with TCCON and the HALO measurements.