



Equatorial measurements in the Total Carbon Column Observing Network (TCCON)

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In 2012, the first equatorial station of the Total Carbon Column Observing Network (TCCON) was established on Ascension Island. During daytime, this station provides continuous total-column averaged dry-air mole fraction of all major greenhouse gases like H₂O, CO₂, CH₄, CO, N₂O, and others.

The station is located strategically between Africa and South America. The total-column measurements cover the whole atmosphere from the ground to the top of the mesosphere. Since Ascension Island is a small island with only sparse vegetation and negligible anthropogenic emissions, most of the observed changes in trace gas columns are expected to be the result of long-range transport of air masses from central Africa (most of the time) or the Amazon region (occasionally). At the same time, Ascension Island is one of the few locations where satellite glint observations by GOSAT or OCO-2 can be validated on a regular basis.

Numerous technical problems had to be solved before a continuous data stream of high quality data could be provided. The time series is now long enough to provide a first evaluation of short-term events like biomass burning as well as seasonal patterns in tropical atmospheric transport.