



An automated ground based FTIR system for validation of satellite total column measurements of CO₂ and CH₄

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Upcoming satellites (such as OCO and GOSAT) measure total column CO₂. These measurements have to be validated. Existing ground-based networks usually only measure within the boundary layer. Airborne measurements are not able to detect stratospheric part of CO₂ and they are too expensive to provide the only validation data. Therefore those methods are not ideal for satellite validation.

Ground-based FTIR instruments however are unique because they can provide measurements of total column atmospheric CO₂ and CH₄ with the necessary accuracy. Unfortunately such measurements are very sparse, especially in the tropical regions.

The Atmospheric Remote Sensing group (ARS) of the Max Planck Institute for Biogeochemistry in Jena, Germany, is currently making the final preparations for installing such an FTIR instrument. The instrument will be part of the Total Carbon Column Observation Network (TCCON) that will provide ground-truth data for satellite validation.

As a fully automated measurement system it will be installed in the tropics, presumably on Ascension Island. This instrument will be able to observe the temporal variation of CO₂ and CH₄ and the results will be interpreted with the help of global source and sink models as well as local flask sample measurements. Additional validation with aircraft measurements and a ship borne FTIR are planned. The system will provide an ideal validation site for future satellite measurements of CO₂ and CH₄ in the very active tropical region.