



## Implementation of SI-traceability in the TCCON and COCCON observations: the Metrology for Comparable and Trustworthy Greenhouse gas remote sensing datasets (24GRD06 MetCTG) project

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Satellite remote sensing of global greenhouse gas (GHG) concentrations provides invaluable information about GHG sources and sinks, supporting efficient climate mitigation policies. Recently, the accuracy targets of upcoming GHG satellite missions have become increasingly stringent (2 ppb of CH<sub>4</sub>; 1 ppm of CO<sub>2</sub>).

Up to now, calibration and traceability of satellite GHG observations relies on two networks of ground-based remote sensing stations: the Total Carbon Column Observing Network (TCCON) and

the COllaborative Carbon Column Observing Network (COCCON). Both networks are able to observe the same quantity as the satellite instruments: column-averaged dry-air mole fraction of CO<sub>2</sub> and CH<sub>4</sub>. They also observe N<sub>2</sub>O, which will likely become another key GHG to be monitored in the future. For traceability, both networks rely on regular aircraft and balloon measurements with in-situ instruments that are traceable to the WMO scale for GHGs.

The 24GRD06 MetCTG project aims at greatly improving the accuracy of underlying spectral line parameters for the satellite GHG retrievals and validating the accuracy with in situ and ground-based observations. This will establish traceability to SI and improve data comparability and trustworthiness among GHG satellite missions. It will also improve consistency among ground-based sites and considerably reduce the need for costly aircraft calibrations.

The project joins the European metrology community with the TCCON and COCCON communities to provide the best ground-based reference for current and future GHG satellite missions.

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