



Validation study of the atmospheric CO₂ concentration measurement thanks to an on ground static Fourier transform spectrometer

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A new kind of Fourier Transform Spectrometer dedicated to atmospheric monitoring has been developed and patented by CNES. This instrument, thanks to a static configuration is reduced in mass and volume and offers consequently promising prospects for the definition of payloads for micro-satellite platforms. This spectrometer could be well adapted to a satellite constellation mission for a long term monitoring.

To validate the instrument concept, an on ground breadboard has been built to measure CO₂ concentration on the total atmospheric column. Measurements are made aiming at the sun, applying the Differential Optical Absorption Spectroscopy technique.

A validation study of the instrument has been undertaken, now with a measurement campaign. It consists in acquiring spectra on short periods in order to test retrieval stability and relative precision and on a long period in order to compare retrievals to the CO₂ concentration cycle and thus characterising the measurement in an absolute way.

We would like to present first the concept of this new generation spectrometer, its advantages and the prospects it enables, then describe the methodology of our validation study and finally depending on the progress of the study, present preliminary results. To illustrate the level of achievement of the breadboard development, spectra will be presented.