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Characterization of a commercial lower-cost medium-precision non-dispersive infrared sensor for atmospheric CO_2 monitoring in urban areas

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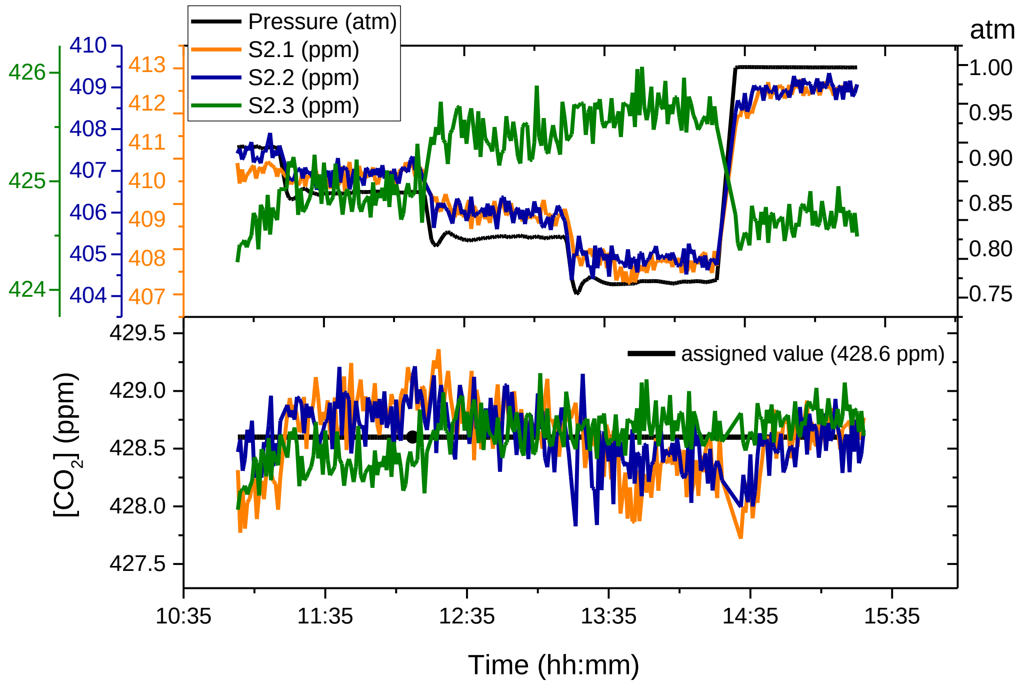

Figure S1: Upper panel – Effect of pressure variations (black) on reported {CO_2} (assigned value =428.6 ppm), S2.1 (orange), S2.2 (blue) and S2.3 (green), please note the different y-axis scales. Lower panel – Corrected {CO_2}.

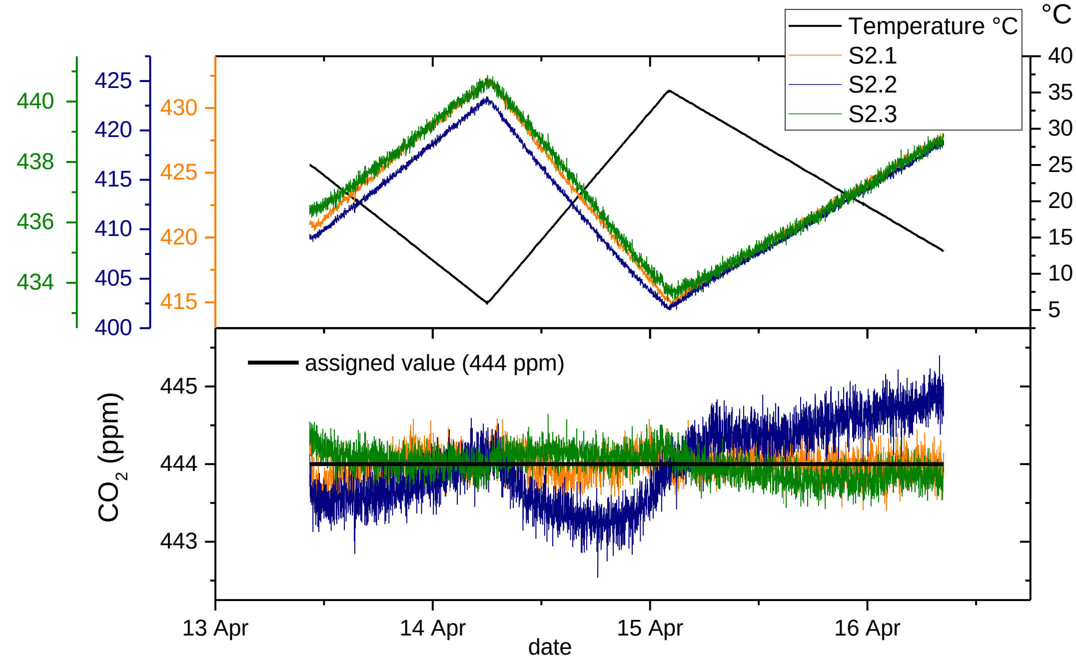

Figure S2: Upper panel – The effect of temperature variations (black) on raw CO_2 dry air mole fractions of HPP3.2 instruments measuring CO_2 from air from the same calibration cylinder (true value =444 ppm), S2.1 (orange), S2.2 (blue) and S2.3 (green), please note the different y-axis scales. Lower panel – Corrected CO_2 dry air mole fractions for HPP3.2 instruments.

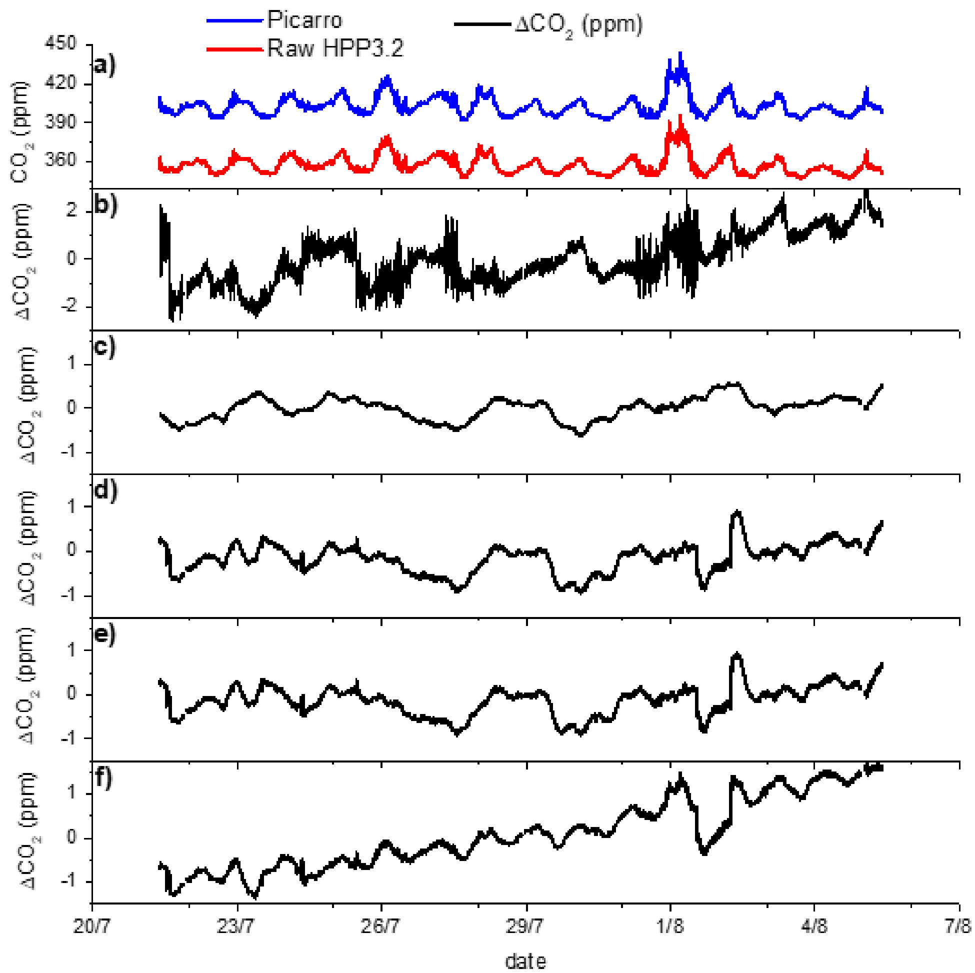

Figure S3: A continuous time series of 1 min averages for HPP3.2 instrument S2.2 compared to the Picarro CRDS instrument after correcting for the different variables for a period of 15 days. Plot (a) shows reported {CO_2} measured by S2.2 and the Picarro. Plot (b) shows the difference between Picarro and S2.2 after offset correction. The next 4 plots (c), (d), (e), (f) show the difference to plot (b) after having correcting the HPP3.2 {CO_2} to fit the Picarro CO_2 using pressure, temperature, water vapor, and linear drift respectively.

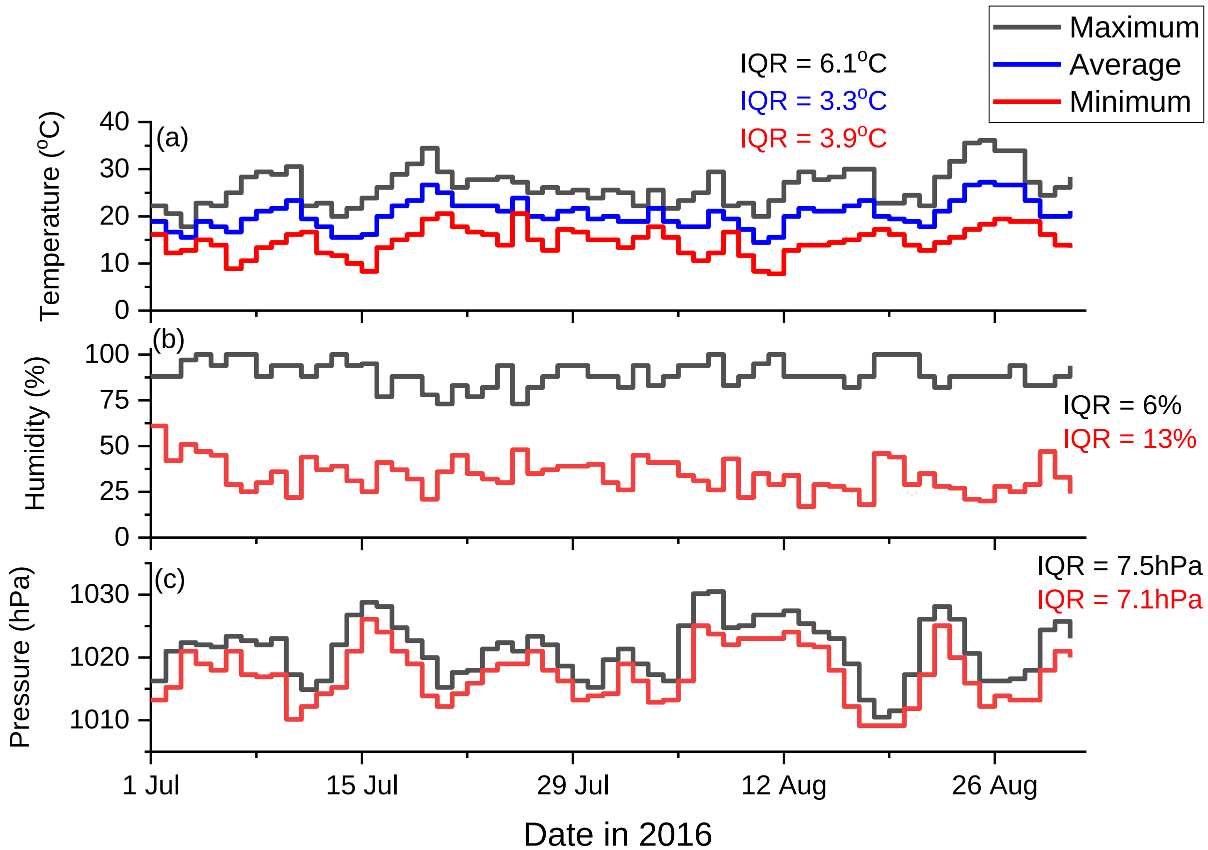

Figure S4: Meteorological conditions in Paris during the Jussieu and Saclay field site tests. Daily minima, average and maxima of temperature (a), relative humidity (b) and pressure (c) are calculated from hourly observations. Interquartile ranges for all variables are also reported.

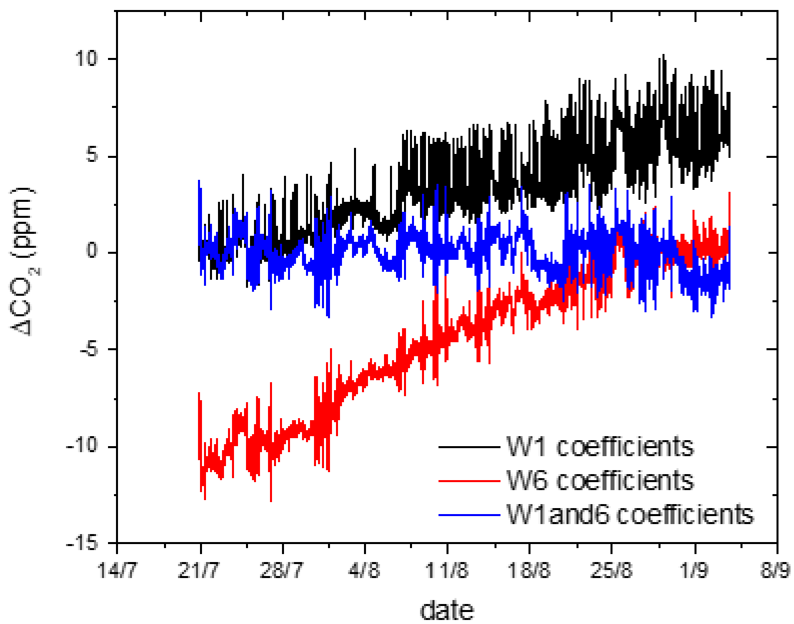

Figure S5: CO_2 ({ CO_2}$_{HPP3}$ - { CO_2}$_{CRDS}$) of HPP3.2 instrument S2.2 during 45 days considering different calibration periods of one week. Results from calibration periods of week one (W1) and week six (W6) are in black and red respectively. The blue curve shows corrected CO_2} when both W1 and W6 are used in the calibration.