# SUPPLEMENT - Intercomparison of low-cost sensors via simultaneous field measurements: a case study

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S1. 2B Ozone monitor shift correction

Due to internal buffering issues, the 2B Ozone Monitor exhibited time misalignment. To ensure a valid comparison, it has been necessary a execute a time-shift correction by matching its time series with that of the AQT. We choose to use the AQT as it was the best option; the SEP exhibit values generally always higher while ASE provides measurements in arbitrary units that have been calibrated using the AQT. The dataset was segmented into 2-day blocks, and for each block, the 2B data were shifted (in 5-minute steps, up to ± 3 days) to maximize the Pearson correlation (R) with AQT data. A local polynomial regression (LOESS) was applied to reduce high-frequency noise. The shift yielding the highest R was applied. The result (figure S1) which depict a good correlation with AQT signal ($R = 0.8351$) and a quite low error ($NMSE = 0.1187$) (indices are grouped in table S1). Bias and slope suboptimal values (respectively 6.131 and 0.6810) are related to ozone measurement being one of the less reliable. This realignment preserved the overall time structure while enabling valid comparisons.
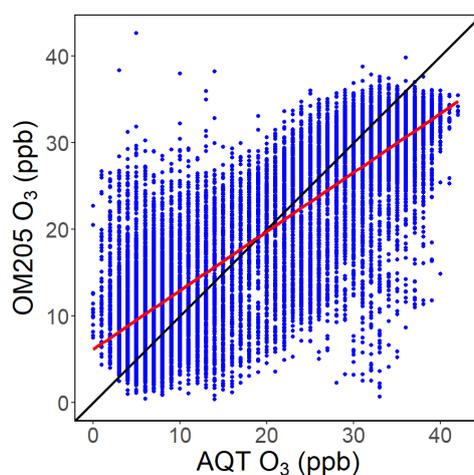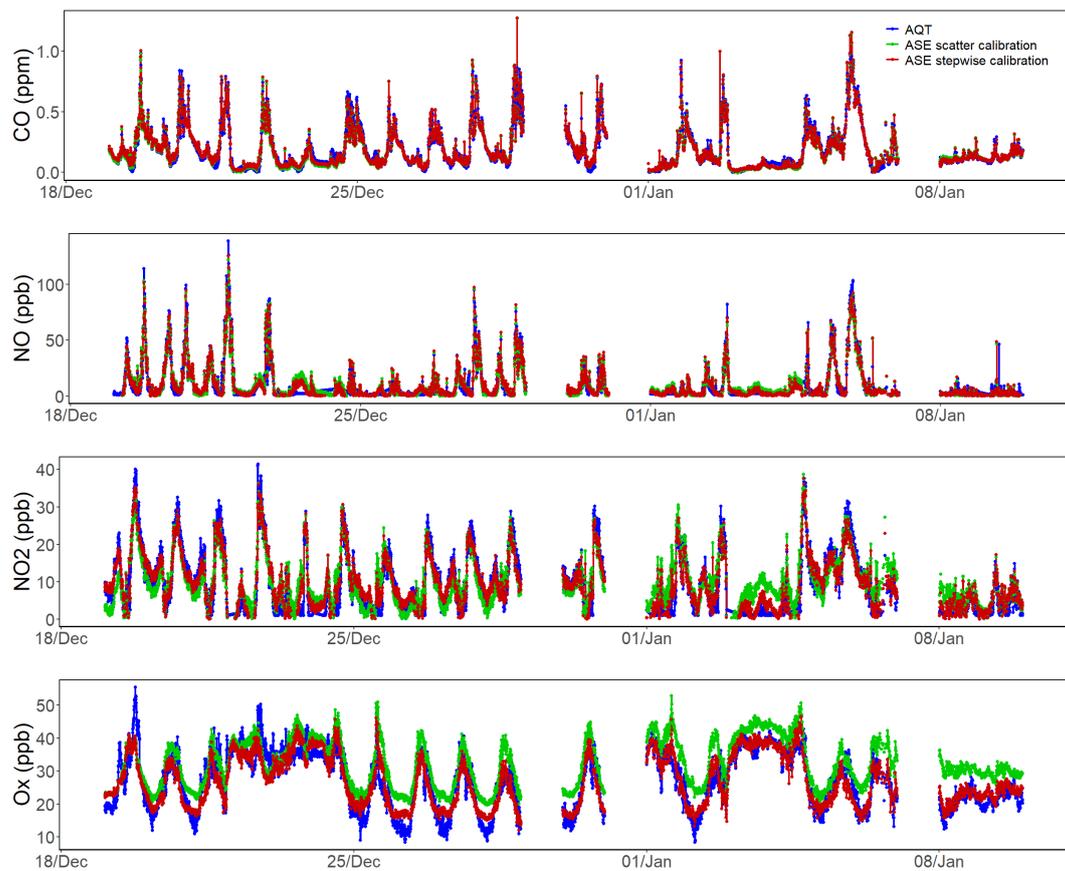

. Figure S1. O_3 scatter plot comparison between 2B Ozone Monitor (after shifting) and AQT.

	R	NMSE	FB	FA2	Bias	Slope
2B Monitor vs AQT	0.8351	0.1187	-0.0006	0.8178	6.131	0.6810

. Table S1. Statistical indices to evaluate the recovered 2B Ozone monitor acquisition.

S2. ASE calibration

. Figure S2. Pollutant concentration time series of the ASE calibrated measurements: scatter method in green and stepwise method in red. In blue the AQT signal used as reference for the calibration.
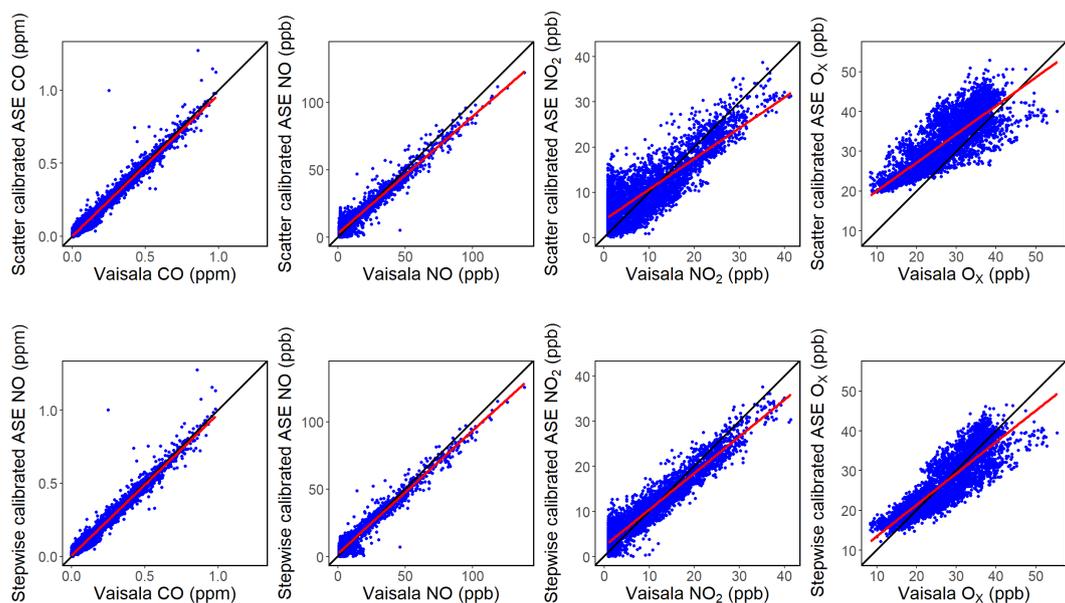
. Figure S3. Scatter plots of the calibrated ASE versus the AQT. At the top for the scatter method, at the bottom for the stepwise method.

. Table S2. Statistical indices used to evaluate the ASE calibration processes.

Physical Quantity	Instruments Compared	R	NMSE	FB	FA2	Bias	Slope
CO	Linear regression	0.9822	0.0296	0.0218	0.9057	0.0019	0.9684
	Stepwise with also T, RH	0.9834	0.0267	0	0.9216	0.0062	0.9674
NO	Linear regression	0.9674	0.1452	-0.0821	0.6450	2.696	0.8696
	Stepwise with also T, RH	0.9777	0.0982	-0.0730	0.6717	2.017	0.9141
NO_2	Linear regression	0.8428	0.1949	-0.0712	0.6708	3.866	0.6793
	Stepwise with also T, RH	0.9564	0.0667	-0.0454	0.8033	2.295	0.8123
O_x	Linear regression	0.8464	0.0557	-0.1776	0.9865	12.90	0.7150
	Stepwise with also T, RH	0.8890	0.0211	0	1	5.628	0.7907

S3. Polluttant-RH correlation
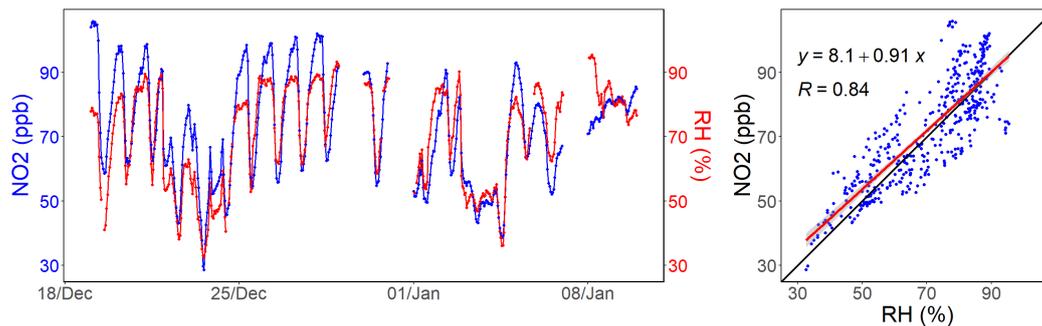
. Figure S4. On the left: visual comparison of SEP $NO2$ and RH time series. On the right scatter plot of the same variables (best fit in red, 0.95 confidence level in gray and bisector in black) with best fit formula ad R factor.
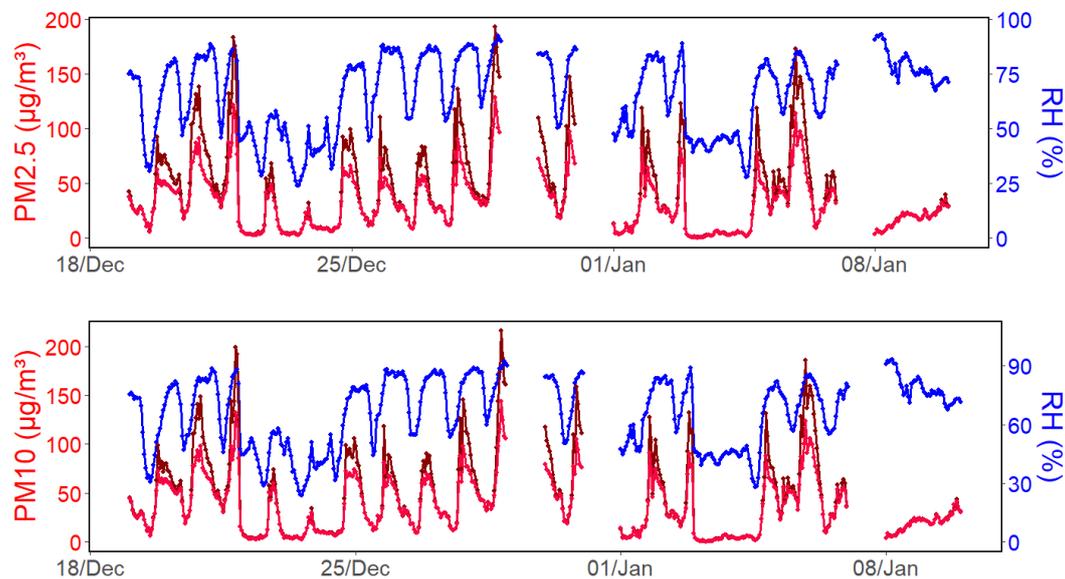
. Figure S5. Graphical comparison of ASE $PM_{2.5}$ and PM_{10} time series with relative humidity. In lighter red is the factory calibrated measurement, while in darker red is the raw one.