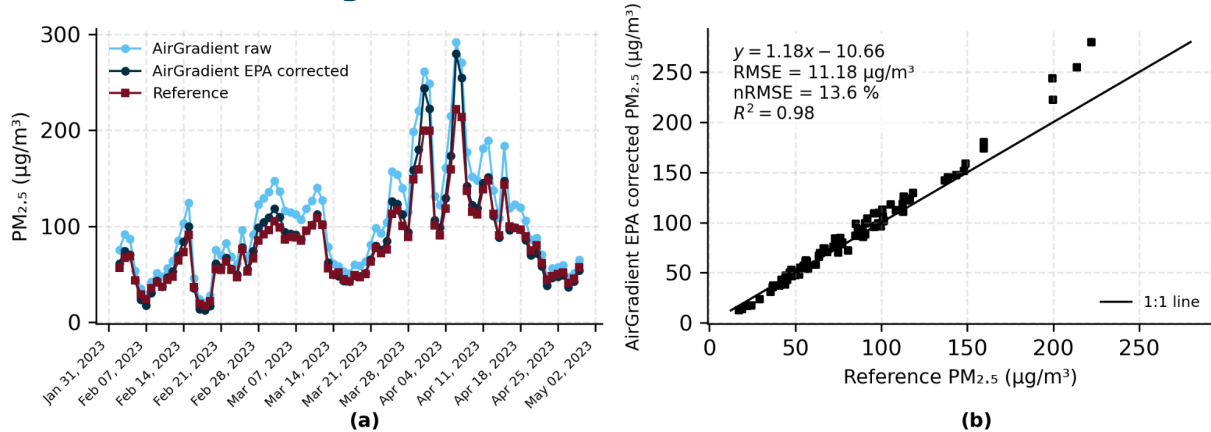


PERFORMANCE OF AIRGRADIENT OUTDOOR PM_{2.5} MEASUREMENTS

Performance in Chiang Mai, Thailand



PM_{2.5} sensing performance in Chiang Mai, Thailand.

(a) Time series comparing raw (grey) and EPA-corrected (blue) AirGradient PM_{2.5} measurements with PM_{2.5} concentrations measured by the reference measurement (red). (b) Scatter plot between Reference and EPA corrected PM_{2.5} measurements. All in 24h resolution.

Performance across 11 locations according to EPA guidelines^[1].

Table 1 – Average performance metrics of PM_{2.5} sensors across 11 evaluated locations.

Performance category	Metrics	Average (Min - Max)	EPA target	# Locations that meet EPA target
Precision	CV, %	6.8 (1.2 - 16.0)	< 30%	11/11
Accuracy	RMSE, µg/m ³	4.4 (1.7 - 11.2)	< 7 µg/m ³ OR < 30 %	10/11
	nRMSE, %	33.0 (13.6 - 58.5)		
Linearity	R ²	0.92 (0.86 - 0.98)	> 0.7	11/11
Bias*	Slope	1.24 (1.08 to 1.49)	1.0 ± 0.35	9/11
	Intercept, µg/m ³	-2.6 (-10.7 to 0.2)	0 ± 5	10/11
Drift	No observable signal drift over a two-year period.			11/11

CV - Coefficient of Variation, (n)RMSE - (normalised) Root Mean Square Error, R² - Coefficient of determination

EPA-correction applied (see below): Note that a site-specific calibration usually leads to better performance results than a generic correction approach

* Bias - a systematic deviation of predicted values from the true, expected, or reference values

Testing Data

DURATION	3521 days worth of data between 2023 and 2025; minimum 50 days per location
LOCATIONS	Belgium: Brussels; Canada: Edmonton, Ottawa; India: Chennai; South Africa: Johannesburg; Switzerland: Zurich; Thailand: Chiang Mai; UK: London (urban and suburban), Cambridge; USA: Anacortes WA
TIME RESOLUTION	24 hours (as per EPA sensor performance guidelines). Default measurement frequency - 5 minutes.
PM _{2.5} SENSORS	AirGradient: Plantower PMS5003T Reference: Various types, all classified as federal equivalent method (FEM) by U.S. EPA
DATA CORRECTION	AirGradient: "EPA-corrected" - Generic correction formula supplied by EPA (October 2021 version, based on CF_atm PM _{2.5} values, equation 4 in this PDF). Reference: Data as supplied by reference data provider
EVALUATION METHOD	According to EPA sensor performance guidelines

Version 1 (February, 2026, 2025.06.29_ae.oi.ri.1440). See [\[link\]](#) for the appendix

[1] - U.S. EPA, 2021. Performance Testing Protocols, Metrics, and Target Values for Fine Particulate Matter Air Sensors. EPA/600/R-20/280 | February 2021