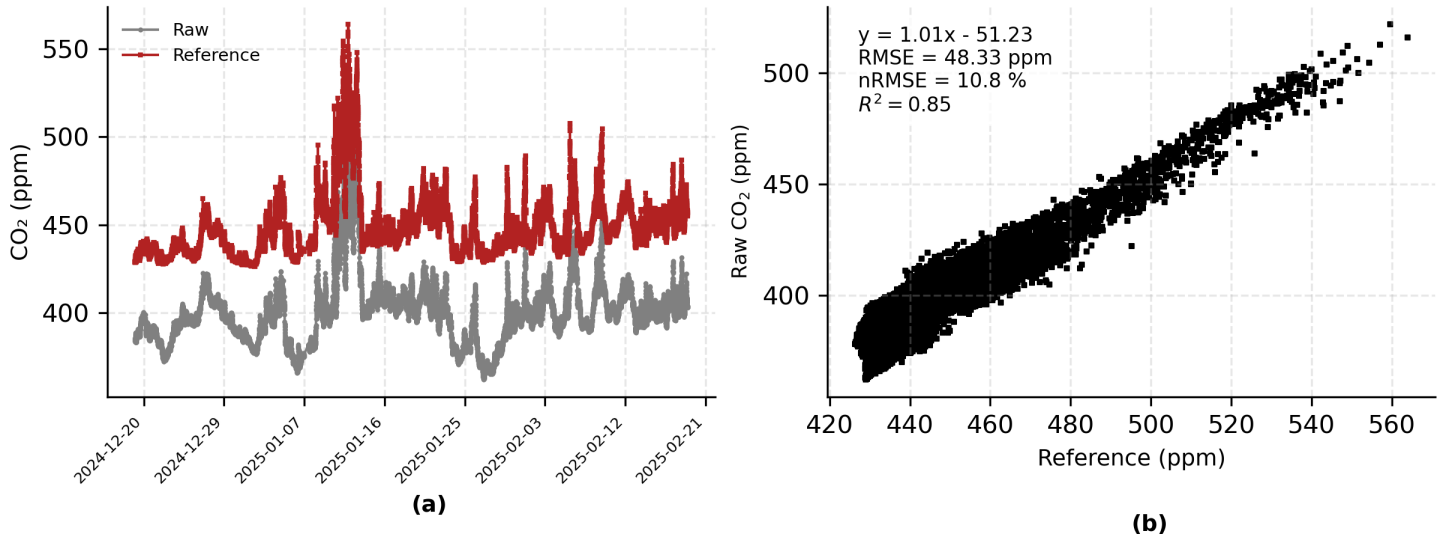


PERFORMANCE OF AIRGRADIENT CO₂ MEASUREMENTS

Air Gradient Outdoor CO₂(SN: 16037578-2) measurements (three months of readings with 5 min resolution) were statistically compared to the [reference instrument](#) at Cambridge University site.

AirGradient measurements closely follow the same temporal patterns as the reference instrument. Peaks, decreases, and overall fluctuations occur simultaneously in both datasets. This confirms that the sensor reliably detects relative changes in CO₂ concentration over time.

The slope close to 1 indicates that the sensor responds proportionally to changes in concentration. The high R² value confirms strong correlation between the sensor and reference measurements.



Absolute Accuracy

While trends are accurately captured, a systematic offset between AirGradient and the reference instrument was observed. During measurements the ABC-correction algorithm was off. This offset varies between sensors and over time and is a known characteristic of low-cost CO₂ sensors. This means the sensor should not be used to determine exact absolute CO₂ concentrations without calibration. However, this offset does not affect the sensor's ability to track changes, trends, and relative differences.

Practical Implications

- Monitoring changes in CO₂ levels over time
- Detecting ventilation effects
- Observing daily and weekly patterns
- Comparing relative conditions between locations or time periods

Calibration Considerations

For scientific applications or situations where accurate absolute concentrations are required, periodic calibration against a reference instrument is recommended. Simple linear calibration can significantly improve accuracy.

Calibration frequency depends on application requirements, but calibration every 1–2 months is recommended for high-accuracy applications.