Overall, the three Aeroqual AQY sensors (Units 130, 131 and 132) showed decreased accuracy with increasing ozone concentration in the laboratory studies; with accuracy ranging from 11.4% at the highest ozone concentration to 79% at the lowest ozone concentration. They underestimated the FEM ozone measurements for a concentration range between 0 to 400 ppb.

The three Aeroqual AQY sensors exhibited high precision for most of the tested T/RH combinations in the environmental chamber.

The Aeroqual AQY sensors (Units 130 and 132) showed low intra-model variability in the field deployment and low to moderate intra-model variability in the laboratory testing (Units 130, 131 and 132).

The Aeroqual AQY sensors had good data recovery (>92% for 5-min average in the field (Units 130 and 132), and 100% for 1-min average in the laboratory (Units 130, 131 and 132)).

For ozone, the Aeroqual AQY sensors (Units 130 and 132) showed very strong correlations with the reference instrument from both the field (R² ~ 0.96) and laboratory studies (R² > 0.97; Units 130, 131 and 132).

Deployment period 12/22/2017- 03/27/2018: the Aeroqual AQY sensors (units IDs: 130 and 132) showed very strong correlations with ozone concentration changes as monitored by the FEM instrument.

The units showed > 92% data recovery as well as low intra-model variability.

Coefficient of Determination (R²) quantifies how the two sensors (Units 130 and 132) followed the ozone concentration change measured by the FEM instrument. An R² approaching the value of 1 reflects a near perfect agreement, whereas a value of 0 indicates a complete lack of correlation.
Accuracy was evaluated by a concentration ramping experiment at 20 °C and 40%. The sensor’s readings at each ramping steady state are compared to the reference instrument. A negative % means sensors’ overestimation by more than two fold. The higher the positive value (close to 100%), the higher the sensor’s accuracy.

Sensor’s ability of generating precise measurements of ozone concentration at low, medium, and high pollutant levels were evaluated under 9 combinations of T and RH, including extreme weather conditions like cold and dry (5 °C and 15%), cold and humid (5 °C and 65%), hot and humid (35 °C and 65%), or hot and dry (35 °C and 15%).

The three Aeroqual AQY sensors showed very strong correlations with the corresponding FEM data (R² > 0.97) at 20 °C and 40% RH.

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