**Field and Laboratory Calibration of low-cost air quality sensors**

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The availability of low-cost light-scattering particulate matter (PM) sensors offers the possibility of improved spatiotemporal PM information. However, this type of sensor needs to be characterized for the conditions of use. This study focuses on field and laboratory calibration of the Plantower PMS PM sensor. Specifically, it evaluates sensor performance in terms of sensor precision, accuracy, limit of detection, drift and linearity of the response. The field evaluation took place over two years through multiple seasons and a variety of elevated PM events, including wintertime inversions, fireworks, and wildfires. It compared the PMS PM2.5 and PM10 concentrations with co-located federal equivalence and federal reference methods. The laboratory evaluation included the development of a calibration chamber that addresses the issue of uneven particle distribution found in conventional cubic chambers. The laboratory tests evaluated 153 Plantower PMS sensors with two types of dust particles, ammonium nitrate and alumina oxide. The laboratory results show high correlations between the reference instrument (TSI DustTrakII) and the PMS 3003 PM2.5 readings (R2>0.978) although the sensor response is highly dependent on particle type. The ambient evaluation of the PMS 3003 also showed high inter-sensor correlations (R2>0.975) and great agreements with FEMs (R2>0.882).