

COMPARISON OF REAL-TIME INSTRUMENTS TO MONITOR AIRBORNE PARTICULATE MATTER

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ABSTRACT

Over the past decade, mounting evidence has suggested that exposure to elevated concentrations of airborne particles with an aerodynamic diameter less than 2.5 μm (PM 2.5) has been associated with changes in morbidity and mortality rates, respiratory function, and cardiovascular hospital admissions in numerous epidemiological studies. U.S. Environmental Protection Agency (EPA) has an approved list of designated Federal Reference Method (FRM) PM 2.5 samplers that are used for regulatory compliance monitoring nationwide. But Alternatives to the FRM PM 2.5 samplers that aren't approved by the EPA, such as the DustTrak aerosol sampler and GRIMM particle analyzer, are often used in field studies and research to measure PM 2.5 in ambient air because of their reduced size, weight, portability, labor cost, and cost of equipment. By validating the GRIMM and DustTrak to those approved methods that the EPA use, we will be able to not only enhance the monitoring to other populations (rural) but also validate the research that is being conducted with these instruments.

This study is designed to show whether the GRIMM and DustTrak are comparable to the Filter Dynamic Measuring System-Tapered Element Oscillating Microbalance (FDMS-TEOM), which is an approved EPA instrument that is use in state or local air quality surveillance.

