Presenter: Mr. David Dikken, CEO Measurement Technology Laboratories, LLC

Presentation Title: “On-Road Ambient Aerosol Ultra-Fine (PM0.2) Sampling with On Filter Particulate Concentration Determination via Gravimetric Quantification and Elemental Analysis via ED-XRF”

Abstract: Over the past few years several publications have correlated deleterious health effects with the inhalation of ultra-fine aerosol particulate. Of key concern are particles with mean diameters of less than 0.2 µm. Making an SI Unit Traceable measurement of the concentration (µg/m3) on these particulates is as challenging as it is valuable for research and policy decisions. Additionally, the collection of the PM0.2 on PTFE filters provides actual collected samples for laboratory elemental analysis of metals by ED-XRF. This presentation covers on-road sampling results of multichannel particulate collection at PM2.5, PM1.0, and PM0.2 on triplicate filters (primary, secondary and tertiary) with elemental speciation from Na to Pb. Additional data was collected for comparison between measurements within the vehicle’s occupancy cabin as well as simultaneously outside the cabin. Samples were collected during rush hour commutes of two hours in Minneapolis, Minnesota USA. Laboratory results were made using advanced robust robotic weighing protocols and speciation via traceable calibrations using spattered standards for each element to calibrate the ED-XRF.