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**Performance of a fast scan mobility based particulate spectrometer** DONALD HAGEN, PHILIP WHITEFIELD, University of Missouri-Rolla — Nanoparticles are emitted from a variety of combustion sources. There is a growing concern, internationally, on the environmental impact of jet engine exhaust emissions in the atmosphere. An accurate assessment requires that the number density and size of the aerosols within engine exhaust and aging plumes be understood and well characterized. Soot particles formed during fuel combustion and emitted metallic particles constitute the solid (nonvolatile) particle fraction present in exhaust plumes. UMR has developed a mobile facility capable of sampling jet and rocket engine exhaust emissions, including both particulate and gas phase species, and has deployed it in numerous ground test and airborne campaigns. Normally emissions measurements are taken with the engine in a stable operating condition. A fast scan particulate spectrometer, Cambustion's DMS500, has recently been added to our facility's instrument suite. It has a fast response, around 200 ms, and covers the size range from 5 to 1000 nm. This fast response allows for reduced engine run times, and therefore lower costs, during measurement campaigns, and for observation of emission transients during changes in engine operating conditions. Here we report on the fast spectrometer's performance in comparison to traditional particulate size and concentration measurement systems, i.e. scanning differential mobility analyzers and condensation nuclei counters.

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