Measuring and reporting PN and PM values from vehicles with different engines, aftertreatment technologies and fuel types

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Accurate measurement of particulate emissions from vehicles is an important step toward the successful abatement of this pollutant from combustion engines. Transient particle mass (PM) and particle number (PN) measurements from multiple measurement systems were compared using an E10 fuelled light-duty GDI vehicle with TWC on chassis dynamometer. The vehicle was tested over various drive cycles, including the US EPA's FTP-75, the LA92, the US06, and the Highway Fuel Economy Test (HWFET). The PM values reported by the 3DATX parSYNC iPEMS are compared against those of a Dekati Mass Monitor (DMM) and AVL Micro Soot Sensor (MSS), while the PN values reported by the parSYNC are compared against those of the AVL Particle Counter (APC) and TSI Engine Exhaust Particle Sizer (EEPS). The matrix method by which the 3DATX parSYNC calculates its values of PN and PM was previously calibrated according to a diesel DPF vehicle, and the results initially presented reflect the difference in the nature of particulate matter emitted from a GDI vehicle. The 3DATX parYSNC particulate matrix is thereby updated for this new engine technology so that the parSYNC reports more representative PN and PM values.