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Development and Performance Characteristics for Selective Particle Characterization of a New Compact LI²SA-Sensor

Selective particle characterization of elemental carbon is essential to appraise the performance characteristics of diesel particle filters and of aerosols in ambient air, respectively. For this, real time investigations are of great interest in order to resolve fast particle property changes. Furthermore, as in recent epidemiological studies indicated, it is absolutely necessary to determine the specific surface area beside mass concentration. A measurement technique which fulfils all these requirements is time-resolved laser-induced incandescence which is the underlying principle of the LI²SA-sensor. For several years this device has become very important in soot characterization. On the one hand it can be applied directly in the raw exhaust without dilution up to peak temperatures of about 700°C, but also used for real-time (20Hz) road-field investigations of fine dust on the other hand. Now a new cost-competitive generation of LI²SA has been developed with increased usability and compactness. Its sensitivity (3µg/m³) and variability for soot characterizing in different applications is shown.

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