

Innovative Coal Solids-Flow Monitoring/Measurement Using Phase Doppler and Mie Scattering Techniques

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ABSTRACT

The coal particulates pass through the interaction and reflect laser signals with phase shifts and scattering signals, which can be used to calculate the particulate size. Along with the particulate counting capability of phase Doppler particle analyzer (PDPA) and particle counting sizing velocimetry (PCSV).

The laser-based instrumentation for solids-flow monitoring(LISM) will be able to measure the solids –flow rate in coal-fired boilers with a high accuracy. The prototype of LISM will be designed and fabricated for the access of the laser-based PDPA and PCSV instrumentation. The lab-scale coal particulate feeder will be used to simulate coal particulate transportation. The measured solid flow rates by LISM will be compared with the actual solid-flow rates. The regression model for the LISM error will be developed by using advanced statistical techniques. It is expected that LISM will be very accurate for measuring the solids- flows in the coal-fired boilers and consequently support to control solids-flow effectively.

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