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Recording of dust particle oscillation path inside electric curtain by laser diode apparatus

Zygmunt Dudzicz

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Keywords

laser diode, particle path visualisation, electric curtain

Abstract

The contribution describes recording of a single dust particle oscillation path inside the electric curtain by a new type of a laser diode apparatus. Visualisation of the particle path trajectory using single pure infrared laser diode, 806 nm, 2 W was analysed. Particle oscillation path was measured from images recorded by CCD monochrome camera. Feasibility of such diode as an efficient light source to illuminate dust particles was verified for experimental investigations in dust technique devices. Particle oscillation paths were recorded throughout changes in the diode beam power and distance. Experimental results were used to determine conditions for the design of a new laser diode apparatus, employing simultaneously several diodes in the laser head. A new type of the laser diode apparatus to record dust trajectory inside electrostatic precipitators and electrostatic separators was developed and tested. A simple high power source of light condensed into a beam proves highly useful in dust technique experiments. Oscillation path and wandering velocity of a single dust particle inside the electric field can be recorded and measured.



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