

Experimental investigation of self-maintained oscillations of dusty macroparticles in RF discharge induced by laser radiation

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The presented work deals with the experimental investigation of oscillations of dusty macroparticles induced by the laser radiation. A dusty plasma structure was observed in the near-electrode layer of RF discharge (power 5 W), buffer gas - air (pressure 0.1 Torr). The experiments were carried out with carbon particles (56-71 μm). The laser beam was injected in the plasma volume perpendicularly to the dusty plasma structure and focused on a single particle. It was discovered, that the oscillations of dusty particles evolved by two distinct ways: 1) fast fading (lifetime less than 1 s., 2) long-lived self-maintained oscillations (lifetime greater than half a minute). The preliminary analysis of experimental data was completed. The value of the typical oscillation frequency was $\nu = 25$ Hz.