

Wave processes in the system of synthesized active Brownian particles

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Dusty plasma is an ionized gas containing charged micro- or nanoscale particles. Spontaneous formation of such particle clusters is observed in different types of gas discharges. Particles that gain charge in plasma have the ability to self-organize into ordered structures, exhibit structural transitions, and excite vortices and waves [1]. If there is an external source of energy, the particles can demonstrate the phenomenon of activity—absorb it and effectively convert it into their own kinetic energy [2].

The results of an experimental study of wave processes in a system of synthesized particles in DC-discharge plasma are presented. The main characteristics of waves in the structure of particles and their changes during long-term exposure to a laser beam are determined. The collective dynamics of synthesized active particles were analyzed, their main dynamic characteristics were determined. It has been shown that with an increasing number of particles in the structure, the characteristics of the waves in the system change.

[1] Arkar K, Vasiliev M M, Petrov O F, Kononov E A and Trukhachev F M 2021 *Molecules* **26**(561)

[2] Bechinger C, Di Leonardo R, Löwen H, Reichhardt C and Volpe G 2016 *Review of Modern Physics* **88**(4)