

# Active Brownian motion of particles in quasi-one-dimensional (chain) structures driven by laser radiation

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Active Brownian particles can convert the energy of the environment into the energy of their own directed motion [1,2].

Experimental results dynamics of chain structures in DC glow discharge are presented. Structures were formed by active Brownian particles. Two types of spherical monodisperse particles were used [3]: fully copper-coated melamin-formaldehyde (MF) and Janus particles (with half surface copper coating).

Result of trajectories analysis, dependences of the MSD for particles motion and the distribution of particle velocities in the radial and vertical directions are presented. With increases of the intensity of laser radiation the mean kinetic energy of dusty particles was increased. For Janus particles this change was non-monotone. Fully coated particles mainly move in the radial direction while maintaining their position in the chain. The position of the Janus particles in the structure was changed with varying the intensity of the laser radiation.

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[1] Aranson I S 2013 *Phys. Usp* **56** 79–92

[2] Bechinger C, Leonardo R D, Löwen H, Reichhardt C, Volpe G and Volpe G 2016 *Rev Mod Phys* **88**

[3] Svetlov A S, Vasiliev M M, Kononov E A, Trukhachev F M and Petrov O F 2023 *Molecules* **Special issue**