

## **Dynamics of an active Brownian particle in a weakly ionized plasma**

E.A. Lysin, I.I. Lisina, O.S. Vaulina

*Joint Institute for High Temperatures, Russian Academy of Sciences, Moscow, Russia*

*Moscow Institute of Physics and Technology, Dolgoprudny, Russia*

An active matter is a dissipative medium containing active particles. Such particles autonomously transform the available environmental energy (chemical, electromagnetic, thermal, etc.) into their own mechanical motion [1]. Artificial active particles, as a rule, consist of composite materials. The constituent parts of such particles interact differently with the medium or have a different response to external disturbances. Regardless of the nature of origin, the system of active particles is far from thermodynamic equilibrium.

Most studies on the dynamics of active Brownian particles deal with active colloidal systems. In our theoretical work, we investigated the dynamics of an active Brownian particle in a weakly dissipative medium, when for a correct description of its motion it is necessary to take into account the ballistic regime at short observation times. The necessary conditions for this can arise, for example, in gaseous or weakly ionized plasma media [1]. Analytical expressions were obtained for the mass transfer evolution function, as well as for the average linear displacement of the active Brownian particle along a given direction.

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### **References**

[1] Bechinger C., Di Leonardo R., Löwen H., Reichhardt C., Volpe G., and Volpe G. Active particles in complex and crowded environments, *Reviews of Modern Physics*, 88(4), 045006 (2016)