

**Diffusion and Brownian motion:  
On the possibility to control diffusion of small particles with laser radiation**

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In this paper, we discuss several problems for the diffusion equation taking into account an external force (Smoluchowski equation). Using the fundamental solution of the free diffusion equation, the Smoluchowski equation is solved in the presence of the small gradient force induced by an interference field of two laser beams. The fundamental solution is obtained for the diffusion equation in the presence of a constant external force, which is a gradient of a linear potential; this equation describes the process of distribution over the whole volume of particles initially concentrated in a small spatial domain. We study kinetics of the concentration gratings of transparent microspheres in a liquid induced by the gradient force in the interference field of laser radiation.