

The Motion of Repulsive Brownian Particles in Quenched Disorder

LIU Gang,^{1,2} LI Bao-Guo,¹ HAN Ru-Shan³ and YANG Sheng-Dong³

¹ Department of Soil and Water Science, China Agriculture University, Beijing 100094, China

² China Institute of Atomic Energy, P.O. Box 275 (18), Beijing 102413, China

³ Department of Physics, Peking University, Beijing 100871, China

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Abstract: Brownian motion of the particles with repulsive interaction is investigated. When the potential condition is satisfied, the eigenvalue problem of interaction Fokker-Planck equation under certain conditions can be transformed to that of a many-particle Schrödinger equation. Using the Green's function method, we obtain the effective single-variable Fokker-Planck equation in the low density limit. We find that the diffusion of coupled Brownian particles in quenched disorder media is also anomalous in 2D. The Mittag-Leffler relaxation of pancake vortices is investigated by fractional Fokker-Planck equation.

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Key words: Fokker-Planck equation, Boson, Green's function, disorder, vortex

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