

Yarovaya E. B., Smorodina N. V. (Lomonosov Moscow State University, Moscow, Russia). **Limit theorems for branching random walks with violation of spatial homogeneity**¹. In [1] the transition from the classical diffusion equation to the perturbed diffusion equation was considered. Fundamental ideas from [1] served as the basis for creating new directions in the study of stochastic processes, using spectral methods, and were further developed in the theory of branching random walks (BRWs) on multidimensional lattices \mathbf{Z}^d , $d \in \mathbf{N}$. In the BRWs, the walk of particles on \mathbf{Z}^d is described, as a rule, by a symmetric random walk. We assume violation of the walk symmetry at a finite number of lattice points. Thus, the operator generating the walk of particles on \mathbf{Z}^d becomes nonself-adjoint. For the BRW model from [2], under the additional assumption that the walk symmetry is broken at a finite number of lattice points, the following theorem is proved.

THEOREM. *For the particle number $\mu_{t,x}(y)$, $y \in \mathbf{Z}^d$, under the initial condition $\mu_{0,x}(y) = \delta_x(y)$ we have $\lim_{t \rightarrow \infty} \sup_{x \in \mathbf{Z}^d} \mathbf{E} \left(e^{-\lambda t} \mu_{t,x}(y) - \varphi_\lambda(y) \eta(x, \infty) \right)^2 = 0$, where λ is the leading eigenvalue of the evolution operator of the mean particle number located at the lattice point, $\varphi_\lambda(y)$ is its eigenfunction and $\eta(x, \infty)$ is a limit martingale.*

СПИСОК ЛИТЕРАТУРЫ

- [1] Kolmogorov A., Petrovsky I., Piscunov N., “Studies of the Diffusion with the Increasing Quantity of the Substance; Its Application to a Biological Problem” Moscow Univ. Bull. Math., 1:6 (1937), 1–25 (in Russian).
- [2] Smorodina N.V., Yarovaya E. B., “Martingale method for studying branching random walks”, V. 77:5, (2022), 193-194.

объем тезисов не должен превышать области выше этой линии (за исключением сносок)

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