Yarovaya E. (Lomonosov Moscow State University, Moscow, Russia). **Behavior of branching walks depending on the structure of the branching environment.** The main difference between a branching random walk (BRW) on the lattice $\mathbb{Z}^d$ in a homogeneous branching environment (BE) from a BRW in an inhomogeneous BE, i.e., an environment where particle generation occurs either in a selected number of lattice points, as in [1], or at each lattice point, but with different particle reproduction intensities, as in [2], is that in the second case the exponential growth rate λ_0 depends not only on the intensity of branching $\beta > 0$, but also of the parameters of the random walk. This effect is observed in the BRW on $\mathbb{Z}$ with a single branching source [1], in which the random walk is given by the difference Laplacian $(\varkappa\Delta u)(z) := \varkappa\sum_{|z'-z|=1}(u(z') - u(z))$, $\varkappa > 0$, $u \in l^2(\mathbb{Z})$, and the second factorial moment of the branching generating function β_2 is exist. If $\beta > 0$, then the eigenvalue λ_0 of the operator $\mathscr{H} = \varkappa\Delta + \beta\mathscr{V}_0$, where $(\mathscr{V}_0 u)(z) = u(0)\delta_0(z)$, the values of the Green functions $G_{\lambda_0}(0, y)$ and $G_{2\lambda_0}(x, 0)$ are explicitly calculated through the parameters β and $\varkappa$. For the number of particles $\mu_{t,x}(y)$ at the point $y \in \mathbb{Z}$ under the condition $\mu_{0,x}(y) = \delta(y - x)$ we prove

Theorem. If $\beta > 0$, then $\lim_{t\to\infty} \sup_{x\in\mathbb{Z}^d} \mathsf{E}\big(e^{-\lambda_0 t}\mu_{t,x}(y) - \lambda_0 G_{\lambda_0}(0, y)\xi_x\big)^2 = 0$, where $\lambda_0 = \sqrt{\beta^2 + \varkappa^2} - \varkappa$, ξ_x is a non-degenerate r.v. that has $\mathsf{E}\xi_x = 1$ and $\mathsf{E}\xi_x^2 = \beta_2 2^{-1} G^2_{\lambda_0}(0, 0) G^{-2}_{\lambda_0}(x, 0)\,(G_{2\lambda_0}(x, 0)/(1 - \beta G_{2\lambda_0}(0, 0)))$.

REFERENCES

[1] E. B. Yarovaya, Branching random walks in an inhomogeneous medium, Moscow Center for Continuous Mathematical Education, Moscow, 2025 (in Russian).

[2] N. V. Smorodina, E. B. Yarovaya, “One limit theorem for branching random walks”, Theory Probab. Appl., 68:4 (2024), 630–642.

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