Platonova M. V. (St. Petersburg, Russia). **On a supercritical branching random walk on a graph periodic with respect to some coordinates.**

We consider a continuous-time branching random walk on $\mathbb{Z}^d$ with branching sources located at lattice points $\Gamma = \{(m,n) \in \mathbb{Z}^d : m = 0 \in \mathbb{Z}^{d_1}, n \in \mathbb{Z}^{d_2}\}$. Assume that all branching sources are identical with intensity β. The motion of particles in space is defined by a continuous-time Markov process with state space $\mathbb{Z}^d$ and transition probabilities given by a matrix of transition intensities $\big\{a(v,u)\big\}_{v,u\in\mathbb{Z}^d}$, subject to the conditions: $a(v,u) \geqslant 0, v \neq u$ and $a(v,v) < 0$, $\sum_{u\in\mathbb{Z}^d} a(v,u) = 0$ for any $v \in \mathbb{Z}^d$, the condition of symmetry and spatial homogeneity $a(v,u) = a(u,v) = a(v-u,0)$. Additionally, we assume the variance of the random walk's jump is finite and the random walk is irreducible.

Let $M(v,u,t)$ denote the mean number of particles at point u at time t, starting with one particle at point v at $t=0$. If $d_1 = 1$ or $d_1 = 2$, let $\beta_c = 0$, and if $d_1 \geqslant 3$, let $\beta_c^{-1} = \int_0^\infty p(t,0,0)\,dt > 0$, where $p(t,x,y)$ is the transition probability of the underlying random walk. Let λ denote the right edge of the spectrum of the generator of the branching random walk.

Theorem. *Let $\beta > \beta_c$. Then $\lambda > 0$ and as $t \to +\infty$*

$$M(v,u,t) = C(v,u,\beta,d_2)e^{\lambda t}t^{-\frac{d_2}{2}}\Big(1+o(1)\Big).$$

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