Kesten, Harry; **Sidoravicius, Vladas**
A shape theorem for the spread of an infection. (English) Zbl 1202.92077
Ann. Math. (2) 167, No. 3, 701-766 (2008).

This paper sharpens our former results in Ann. Probab. 33, No. 6, 2402–2462 (2005; Zbl 1111.60074), for the following model for the spread of a rumor or infection: There is a "gas" of so-called A-particles, each which performs a continuous time simple random walk on $\mathbb{Z}^d$, with jump rate D_A. The number of A-particles at x just before the start, $N_A(x, 0-)$, are mutually independent over x and have a mean μ_A Poisson distribution. In addition there are B-particles which perform continuous time simple random walks with jump rate D_B. A finite number of B-particles are started in the system at time 0. The positions of these initial B-particles are arbitrary and non-random. The B-particles move independent of each other. The only interaction occurs when a B-particle and an A-particle coincide; the latter instantaneously turns into a B-particle.

The paper studies the growth of the set $\bar{B}(t) = \{x \in \mathbb{Z}^d$: a B-particle visits x during $[0, t]$

Reviewer: Bo Markussen (Kopenhagen)

MSC:

92D30 Epidemiology
60K35 Interacting random processes; statistical mechanics type models; percolation theory
82C22 Interacting particle systems in time-dependent statistical mechanics
60G50 Sums of independent random variables; random walks

Keywords:

interacting particles; random walk; halfspaces; superconvolutivity; frog model

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