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Analysis of exact tail asymptotics for singular random walks in the quarter plane. (English)

Zbl 1273.60054

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The paper considers random walks in the quarter plane. Let $p_{ij}, i, j = 0, \pm 1$ be transition probabilities of the walk inside the quarter plane. The walk is said to be singular if $h(x, y) = xy \left(\sum_{i=-1}^1 \sum_{j=-1}^1 p_{i,j} x^i y^j - 1 \right)$, as a polynomial of two complex variables x and y , is either reducible or of degree one in at least one variable. The paper gives exact light tail asymptotics for stationary distribution for all eight possible different cases for the singular random walks.

Reviewer: Oleg K. Zakusilo (Kyiv)

MSC:

60G50 Sums of independent random variables; random walks

60J10 Markov chains (discrete-time Markov processes on discrete state spaces)

60K25 Queueing theory (aspects of probability theory)

Cited in 6 Documents

Keywords:

singular random walks in the quarter plane; generating functions; stationary probabilities; kernel method; asymptotic analysis; dominant singularity; exact tail asymptotics

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