

Benjamini, Itai; Pemantle, Robin; Peres, Yuval

Martin capacity for Markov chains. (English) Zbl 0840.60068

Ann. Probab. 23, No. 3, 1332-1346 (1995).

Kakutani has proved that a compact set $\Lambda \subseteq \mathbb{R}^d$ is visited with positive probability by a d -dimensional Brownian motion ($d \geq 3$) if and only if Λ has positive Newtonian capacity. A more quantitative relation holds between this probability and capacity. The probability that a transient Markov chain, or a Brownian path will ever visit a given set Λ is classically estimated by using the capacity of Λ with respect to the Green kernel $G(x, y)$. The authors show that replacing the Green kernel by the Martin kernel $G(x, y)/G(0, y)$ yields improved estimates, which are exact up to a factor of 2. These estimates are applied to random walks on lattices and reveal a connection of Lyons-type between capacity and percolation on trees.

Reviewer: [S.L.Kalpazidou \(Thessaloniki\)](#)

MSC:

- [60J45](#) Probabilistic potential theory
- [60J10](#) Markov chains (discrete-time Markov processes on discrete state spaces)
- [60J65](#) Brownian motion
- [60G50](#) Sums of independent random variables; random walks
- [60K35](#) Interacting random processes; statistical mechanics type models; percolation theory

Cited in **13** Documents

Keywords:

[Newtonian capacity](#); [Green kernel](#); [random walks on lattices](#); [percolation on trees](#)

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