

Recurrence and transience of excited random walks on \mathbb{Z}^d and strips

Martin P.W. Zerner, *University of Tuebingen*

Abstract

We investigate excited random walks on \mathbb{Z}^d , $d \geq 1$, and on planar strips $\mathbb{Z} \times \{0, 1, \dots, L-1\}$ which have a drift in a given direction. The strength of the drift may depend on a random i.i.d. environment and on the local time of the walk. We give exact criteria for recurrence and transience, thus generalizing results by Benjamini and Wilson for once-excited random walk on \mathbb{Z}^d and by the author for multi-excited random walk on \mathbb{Z} .

Full text: [PDF](#) | [PostScript](#)

Pages: 118-128

Published on: July 7, 2006

Bibliography

1. G. Amir, I. Benjamini and G. Kozma. Excited random walk against a wall. *Preprint available at <http://arxiv.org/abs/math.PR/0509464>* (2005). Math. Review number not available.
2. T. Antal and S. Redner. The excited random walk in one dimension. *J. Phys. A: Math. Gen.* 38 (2005), 2555--2577. [Math. Review 2005k:82026](#)
3. I. Benjamini and D.B. Wilson. Excited random walk. *Elect. Comm. Probab.* 8 (2003), 86--92. [Math. Review 2004b:60120](#)
4. G. Kozma. Excited random walk in three dimensions has positive speed. *Preprint available at <http://arxiv.org/abs/math.PR/0310305>* (2003). Math. Review number not available.
5. G. Kozma. Excited random walk in two dimensions has linear speed. *Preprint available at <http://arxiv.org/abs/math.PR/0512535>* (2005). Math. Review number not available.
6. S. P. Meyn and R. L. Tweedie. *Markov Chains and Stochastic Stability*. (1993) Springer. [Math. Review 95j:60103](#)
7. A.G. Pakes. On the critical Galton-Watson process with immigration. *J. Austral. Math. Soc.* 12 (1971), 476--482. [Math. Review 0307370](#)
8. T. Sellke. Reinforced random walk on the d -dimensional integer lattice. *Technical report #94-26, Dept. of Statistics, Purdue University*. (1994) Math. Review number not available.
9. A.-S. Sznitman and M.P.W. Zerner. A law of large numbers for random walks in random environment. *Ann. Probab.* 27, No. 4 (1999), 1851--1869. [Math. Review 2001f:60116](#)
10. M.P.W. Zerner. Multi-excited random walks on integers. *Probab. Theory Related Fields* 133 (2005), 98--122. [Math. Review 2197139](#)
11. M.P.W. Zerner and F. Merkl. A zero-one law for planar random walks in random environment. *Ann. Probab.* 29 (2001), 1716--1732. [Math. Review 2003a:60144](#)
12. A. Zubkov. The life spans of a branching process with immigration. *Theory Prob. Appl.* 17 (1972), 174--183. [Math. Review 0300351](#)

Research Support Tool

[Capture Cite](#)
[View Metadata](#)
[Printer Friendly](#)

▼ [Context](#)

[Author Address](#)

▼ [Action](#)

[Email Author](#)
[Email Others](#)

