A functional limit theorem for a 2d-random walk with dependent marginals

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Abstract

We prove a non-standard functional limit theorem for a two dimensional simple random walk on some randomly oriented lattices. This random walk, already known to be transient, has different horizontal and vertical fluctuations leading to different normalizations in the functional limit theorem, with a non-Gaussian horizontal behavior. We also prove that the horizontal and vertical components are not asymptotically independent.

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Bibliography

1. P. Billingsley. *Convergence of probability measures.* 2nd edition, Wiley, New York, (1999). MR1700749
2. M. Campanino and D. Pétritis. On the physical relevance of random walks: an example of random walks on randomly oriented lattices *"Random walks and geometry", V. Kaimanovitch (ed.), Walter de Gruyter* (2004), 393--411. MR2087791
3. M. Campanino and D. Pétritis. Random walks on randomly oriented lattices. *Mark. Proc. Rel. Fields* 9 (2003), 391-412. MR2028220
4. C. Dombry and N. Guillotin-Plantard. Discrete approximation of a stable self-similar stationary increments process. To appear in *Bernoulli* (2008).
5. N. Guillotin-Plantard and A. Le Ny. Transient random walks in dimension two. *Theo. Probab. Appl.* 52, No 4 (2007), 815--826.
6. H. Kesten and F. Spitzer. A limit theorem related to a new class of self similar processes. *Z. Wahrsch. Verw. Gebiete* 50, (1979), 5--25. MR0550121
7. J.F. Le Gall. Mouvement Brownien, processus de branchement et superprocessus. Notes de Cours de DEA, Ecole Normale Supérieure. *Available on the website of E.N.S., rue d'Ulm, département de mathématiques (1994).*
8. D. Revuz and M. Yor. *Continuous martingales and Brownian motion.* Springer (1991). MR1083357