On the Zero-One Law and the Law of Large Numbers for Random Walk in Mixing Random Environment

Firas Rassoul-Agha, *Ohio State University, USA*

Abstract

We prove a weak version of the law of large numbers for multi-dimensional finite range random walks in certain mixing elliptic random environments. This already improves previously existing results, where a law of large numbers was known only under strong enough transience. We also prove that for such walks the zero-one law implies a law of large numbers.

Full text: PDF | PostScript

Pages: 36-44

Published on: March 4, 2005

Research Support Tool

Capture Cite
View Metadata
Printer Friendly

▼ Context

Author Address

▼ Action

Email Author
Email Others

Bibliography

Alili, S. Asymptotic behaviour for random walks in random environments. *J. Appl. Probab.* 36 (1999), no. 2, 334--349. MR1724844 (2000i:60120)

Comets, F. and Zeitouni, O. A law of large numbers for random walks in random mixing environments. *Ann. Probab.* 32 (2004), no. 1B, 880--914. MR2039946

Dobrushin, R. L. and Shlosman, S. B. Completely analytical Gibbs fields. *Statistical physics and dynamical systems (Köszeg, 1984),* 371--403, Progr. Phys., 10, *Birkhäuser Boston, Boston, MA,* 1985. MR0821307 (87d:82007)

Georgii, H.-O. Gibbs measures and phase transitions. de Gruyter Studies in Mathematics, 9. *Walter de Gruyter & Co., Berlin,* 1988. xiv+525 pp. ISBN: 0-89925-462-4 MR0956646 (89k:82010)

Kalikow, S. A. Generalized random walk in a random environment. *Ann. Probab.* 9 (1981), no. 5, 753--768. MR0628871 (84c:60101)

Rassoul-Agha, F. The point of view of the particle on the law of large numbers for random walks in a mixing random environment. *Ann. Probab.* 31 (2003), no. 3, 1441--1463. MR1989439 (2004h:60151)

Rassoul-Agha, F. Large deviations for random walks in a mixing random environment and other (non-Markov) random walks. *Comm. Pure Appl. Math.* 57 (2004), no. 9, 1178--1196. MR2059678 (2005b:60067)

Solomon, F. Random walks in a random environment. *Ann. Probability* 3 (1975), 1--31. MR0362503 (50 #14943)

Sznitman, A.-S. An effective criterion for ballistic behavior of random walks in random environment. *Probab. Theory Related Fields* 122 (2002), no. 4, 509--544. MR1902189 (2003c:60168)

Sznitman, A.-S. and Zerner, M. A law of large numbers for random walks in random environment. *Ann. Probab.* 27 (1999), no. 4, 1851--1869. MR1742891

(2001f:60116)

Varadhan, S. R. S. Large deviations for random walks in a random environment. Dedicated to the memory of Jürgen K. Moser. *Comm. Pure Appl. Math.* 56 (2003), no. 8, 1222--1245. MR1989232 (2004d:60073)

Zerner, M. P. W. A non-ballistic law of large numbers for random walks in i.i.d. random environment. *Electron. Comm. Probab.* 7 (2002), 191--197 (electronic). MR1937904 (2003h:60149)

Zerner, M. P. W. and Merkl, F. A zero-one law for planar random walks in random environment. *Ann. Probab.* 29 (2001), no. 4, 1716--1732. MR1880239 (2003a:60144)