

Bolthausen, Erwin; Schmock, Uwe

On self-attracting random walks. (English) [Zbl 0829.60021](#)

Cranston, Michael C. (ed.) et al., Stochastic analysis. Proceedings of the Summer Research Institute on stochastic analysis, held at Cornell University, Ithaca, NY, USA, July 11-30, 1993. Providence, RI: American Mathematical Society. Proc. Symp. Pure Math. 57, 23-44 (1995).

Let $((X_t, t \geq 0), P)$ denote a continuous-time, symmetric, nearest-neighbor random walk on Z^d . For every $T > 0$ define the transformed path measure $dP_T := (1/Z_T) \exp(H_T) dP$, where H_T imparts the self-attracting interaction of the paths up to T , and Z_T is the appropriate normalizing constant. The purpose of the paper is a discussion of the behavior of P_T as $T \rightarrow \infty$ for specific H_T . The authors consider the cases of H_T given by a potential function V on Z^d as well as $H_T = -N_T$, where N_T denotes the number of points visited by the random walk up to time T . In both situations the typical paths under P_T as $T \rightarrow \infty$ clump together much more than those of the free random walk and give rise to localization phenomena. The paper mainly discusses the results contained in [first author, Ann. Probab. 22, No. 2, 875-918 (1994; [Zbl 0819.60028](#))] and the authors, "On self-attracting d - dimensional random waves" (Preprint, 1994)].

For the entire collection see [[Zbl 0814.00017](#)].

Reviewer: [O.Brockhaus \(Bonn\)](#)

MSC:

[60F10](#) Large deviations

[60F05](#) Central limit and other weak theorems

[60K35](#) Interacting random processes; statistical mechanics type models; percolation theory

[Cited in 4 Documents](#)

Keywords:

[nearest-neighbor random walk](#); [self-attracting interaction](#); [localization phenomena](#)