THE GENERALIZED EXCITED RANDOM WALK ON $\mathbb{Z}^d$

ALEJANDRO F. RAMÍREZ

RESUMEN. Let $p \in (0.5, 1)$. Consider two simple random walks on $\mathbb{Z}^d$: (X_n) which is symmetric, and a random walk (Y_n) which when it is at site x, it jumps to the right with probability $p/(2d)$, to the left with probability $(1-p)/(2d)$ and to the other nearest neighbors of site x with probability $1/(2d)$. The excited random walk is a self-interacting discrete time process introduced in 2003 by Benjamini and Wilson and defined as follows: if at a given time n, the walk is at a site x which it visited previously, it jumps according to the transition probabilities of the symmetric walk (X_n); if the walk is at a site which it visits for the first time, it jumps according to the transition probabilities of (Y_n). It has been proved that the excited random walk is transient to the right, ballistic and satisfies a central limit theorem in dimensions $d \geq 2$. Nevertheless, the known techniques to prove these results, break up when the underlying processes (X_n) and (Y_n) are replaced by, for example, non homogeneous random walks. Using new techniques, we prove that under minimal requirements on these process, that the underlying generalized excited random walk is ballistic.

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FACULTAD DE MATEMÁTICAS, PONTIFICIA UNIVERSIDAD CATÓLICA DE CHILE, CASILLA 306 - CORREO 22, SANTIAGO, CHILE, TELÉFONO: [56](2)686-5466, E-MAIL: ARAMIREZ@MAT.PUC.CL