THE FAVORITE SITES OF SUBDIFFUSIVE BIASED WALKS ON A GALTON-WATSON TREE

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Abstract: Erdős and Révész initiated the study of favorite sites by considering the one-dimensional simple random walk. We investigate in this paper the same problem for a class of null-recurrent randomly biased walks on a super-critical Gaton-Watson tree. We prove that in the subdiffusive regime, there is some parameter $\kappa \in (1, \infty]$ such that the set of the favorite sites of the biased walk is almost surely bounded in the case $\kappa \in (2, \infty]$, tight in the case $\kappa = 2$, and oscillates between a neighborhood of the root and the boundary of the range in the case $\kappa \in (1, 2)$. The proof relies on the exploration of the Markov property of the local times process with respect to the space variable and on a precise tail estimate on the maximum of local times, using a change of measure for multi-type Galton-Watson trees. This is a joint work with Loïc de Raphélis of Université Paris VI and Yueyun Hu of Université Paris XIII.