

SOME QUESTIONS CONCERNING RANDOM WALKS ON TREES IN A RANDOM ENVIRONMENT

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Abstract: Consider the speed $v(\lambda)$ of the λ -biased random walk on Galton-Watson trees. It was proved by Lyons, Pemantle & Peres that the speed $v(\lambda)$ exists. Recently E. Aidekon gave a nice formula for $v(\lambda)$ by computing the invariant measure for the walk. It was conjectured that $v(\lambda)$ is monotone on $0 < \lambda < m$, where m is the mean of offspring. The conjecture is verified for λ very close to m , and very close to 0 respectively, by G. Ben Arous, Y. Hu, S. Olla and O. Zeitouni, G. Ben Arous, A. Fribergh and V. Sidoravicius. The monotonicity problem received many recent interests and has many alternatives. In the same spirit we consider the simple random walk on the infinite cluster of the Bernoulli bond percolation of trees, and investigate the relation between the speed of the simple random walk and the retaining probability p by studying three classes of trees. A sufficient condition is established for Galton-Watson trees. Some observations are made and some questions are raised. .