İSTANBUL ANALYSIS SEMINARS

ON THE OPTIMAL SURVIVAL STRATEGY OF BRANCHING BROWNIAN MOTION IN A RANDOM TRAP FIELD

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Abstract: We study a branching Brownian motion Z evolving in $\mathbb{R}^d$, where a uniform field of Poissonian traps are present. Each trap is a ball with constant radius. We discuss the survival problem of Z, namely, the asymptotics of the annealed probability that none of the particles of Z hits a trap. Then, we focus on a convergence result on the speed of branching Brownian motion, which is intimately related to the celebrated Fisher-KPP(Kolmogorov-Petrovskiy-Piskunov) equation. Finally, we apply this convergence result to the survival problem, and prove an upper bound on the number of particles that the system produces given that it avoids the trap field up to time t. This bound is an example of an 'optimal survival strategy.'

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