Seminário de sistemas dinâmicos e estocásticos

Departamento de Matemática - IMECC - UNICAMP

Scaling Limit for Branching Random Walks in Random Environment

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Resumo:

We study the large scale dynamics of particles moving independently from each other and branching at rates which depend on their position. These rates are determined by i.i.d. random variables which do not vary in time. On average the particles behave like the solution to the parabolic Anderson model (PAM). PAM can be solved in dimension less or equal to 3, but for dimensions 2 and 3 a renormalisation is needed, as well as the theory of regularity structures or paracontrolled distributions. We introduce an averaging parameter, which relates the number of particles to the intensity of the environment noise. Under strong averaging the particle system converges to the solution of PAM. At a critical value the particle system converges to a superprocess (or a continuous time branching process) which is a rough analogous of the superbrownian motion, with the heat operator replaced by the Hamiltonian associated to PAM. In which sense this convergence holds true, and how this superprocess can be characterized is work in progress.

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