CENTRE
DE RECHERCHES
MATHÉMATIQUES

Systèmes de branchement, équations de réaction-diffusion
et modèles de population
2-13 av 2022

Branching systems, reaction-diffusion equations and population models
May 2-13, 2022

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The speed of invasion on an advancing population

We derive rigorous estimates on the speed of invasion of an advantageous trait in a spatially advancing population in the context of a system of one-dimensional coupled F-KPP equations. The model was introduced and studied heuristically and numerically in a paper by Venegas-Ortiz et al. In that paper, it was noted that the speed of invasion by the mutant trait is faster when the resident population ist expanding in space compared to the speed when the resident population is already present everywhere. We use probabilistic methods, in particular the Feynman-Kac representation, to provide rigorous estimates that confirm these predictions.

Based on joint work in progress with A. Bovier.