MOHAMMAD EL SMAILY, University of Northern British Columbia
Optimal initial data for an RD model with drift

We consider a reaction-diffusion model with a drift term in a bounded domain. Given a time T, we prove the existence and uniqueness of an initial datum that maximizes the total mass $\int_\Omega u(T,x)\mathrm{d}x$ in the presence of an advection term. In a population dynamics context, this optimal initial datum can be understood as the best distribution of the initial population that leads to a maximal the total population at a prefixed time T. We also compare the total masses at a time T in two cases: depending on whether an advection term is present in the medium or not. We prove that the presence of a large enough advection enhances the total mass. This talk is based on joint work with Omar Abdul Halim from UNBC.