

Some mathematical Reaction-Diffusion problems posed on non coincident spatial domains arising in population dynamics

Michel Langlais

Université Bordeaux 2 (France)

Most Reaction-Diffusion systems found from the available literature are posed on a single spatial domain. This is the case for most models arising in population dynamics wherein interacting species are assumed to be spatially distributed on the same spatial domain, cf. the books of Murray, Cantrell and Cosner, Okubo and Levin. In many circumstances species are living in different spatial ranges and do interact only within a common subdomain they share. Typical examples are found from predator-prey systems (predators do not reproduce on hunting sites), interspecific transmission of parasite models (criss-cross transmission, vector transmission, indirect transmission through the environment). New interesting mathematical modelling questions arise (local vs non local interactions) yielding new mathematical PDEs problems. From Ecological or Epidemiological point of views it is important to understand the impact of such a spatial organisation on the invasion and persistence of predators or parasites. Some specific examples will be dealt with in this talk.