Michel Langlais
Universite Bordeaux Segalen
e-mail: michel.langlais@u-bordeaux2.fr
E. Gillot-Fromont
VetAgro Sup, Campus Vétérinaire de Lyon, Lyon (France)
M. Lélu
VetAgro Sup, Campus Vétérinaire de Lyon, Lyon (France)

Prey abundance, fragmented spatial structures and predator persistence in a predator-prey mathematical model

In this talk we develop a complex fragmented spatial model in which both dispersing well-fed and starving domestic cat populations are sharing a common multi-patch range occupied by non dispersing prey. The overall dynamic is rather intricate to decipher for Lotka-Volterra functional responses to predation. It becomes even quite complex when Holling type II functional responses to predation are considered. Assuming dispersal occurs at a fast time scale while reproduction and predation are much slower processes it is possible to transform our complex model into a simpler one for which some (local) stability analysis is feasible. A toy model consists of a spatial range made of three patches with two resident predators in the first two patches, that can be either a well-fed or a starving resident predator, and no predator at all in the third one, predators traveling all over the spatial range. For the three resulting toy models more (local) stability analysis results are available and illustrated by numerical simulations.