Some recent developments on a singular predator-prey model

Jong-Shenq Guo

Tamkang University
E-mail: jsguo@mail.tku.edu.tw

Abstract

We consider a singular predator-prey model which describes the interaction between native birds and introduced cats in an island. Taking into account the spatial dependence (or, random movements), the dynamics becomes much more involved than the corresponding kinetic system. We shall describe some recent developments of this reaction-diffusion system for different values of growth rates for birds and cats. There is the so-called spatio-temporal oscillations, namely, solutions asymptotically become spatial-homogeneous and time-periodic. On the other hand, we analyze the corresponding shadow system when the diffusion coefficient of birds becomes very large. Some global and non-global existence results for this shadow system are obtained. Finally, some open problems are to be given. This talk is based on joint works with Arnaud Ducrot and Masahiko Shimojo.