

A Prey - Predator Model with Hysteresis and Convective Effect

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ABSTRACT

In this talk we will consider a prey-predator population model which could take into account the hysteresis effect in the evolution of the populations. It is known that hysteresis is encountered in many phenomena like phase transitions, plasticity, ferroelectricity, superconductivity, etc. Let us note that there are indications for existence of hysteresis in various biological problems.

In this talk we will apply the L^∞ -energy method which was recently launched and found to be effective tool applicable to various types of parabolic equations and systems including doubly nonlinear parabolic equations, porous medium equations, strongly nonlinear parabolic equations governed by the ∞ -Laplacian, etc. The core of the L^∞ -energy method is the derivation of energy estimates in L^∞ even when any energy estimates could not be expected in L^p , where $1 \leq p < \infty$. In this talk we will develop L^∞ -estimates which could be applied to problems from population dynamics with hysteresis effect whose typical example is a prey-predator system with hysteresis and convective effect. We will obtain results for existence and uniqueness of solution of the population model with hysteresis effect described by the system under consideration.

Key Words: prey-predator model, hysteresis, subdifferential, L^∞ -energy method

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