FIRST WORKSHOP

"DYNAMICAL SYSTEMS APPLIED TO
BIOLOGY AND NATURAL SCIENCES "

ABSTRACT | Yves Dumont

Title

Vector Control for the Chikungunya Disease: chemical control versus biological control.
A Mathematical point of view

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Abstract

The aim of this talk is to present recent investigations on the Chikungunya Disease that hitted Réunion Island, a French territory in Indian Ocean, in 2005 and 2006. Chikungunya is a vector-borne Disease, usually localized in Asia and East-Africa. In 2005, it was the first time that a developed country was affected by this virus. In July 2007, a small outbreak raised in Italy, indicating that the South of Europe is potentialy threatened. In recent works, we have proposed and studied a mathematical model to explain the outbreak of 2005 and possible links with the explosive epidemic of 2006. We also have focused our study in the comparison on different mosquito control tools (adulticide, larvicide, and mechanical control), in order to know if it would have been possible to contain or to stop the epidemic of 2006. Recently, a new project has began to check the feasability of the Sterile Insect Technique (SIT) as a tool for vector-control in Réunion Island. After a short review on the Chikungunya virus, its principal Vector, *Aedes albopictus*, and recent biological results, we will present the mathematical models developed to assess the efficacy of the vector-control tools used in Réunion Island. We will introduce the SIT project, provide some recent results, and compare them to the previous ones. Finally, we will end the presentation with some prospective works.