



CRM APPLIED MATHEMATICAL PHYSICS (CAMP) SEMINARS

Konstantin Starkov

Instituto Politécnico Nacional, CITEDI (México)

TUMOR CLEARANCE PROBLEM IN DYNAMICAL CANCER MODELS WITH IMMUNOTHERAPY AND GLOBAL STABILITY ANALYSIS

In this work we consider the ultimate dynamics of the Kirschner-Panetta model which was created for studying the immune response to tumors under special types of immunotherapy. New ultimate upper bounds for compact invariant sets of this model are given, as well as sufficient conditions for the existence of a positively invariant polytope. We establish three types of conditions for the nonexistence of compact invariant sets in the domain of the tumor-cell population. Our main results are two types of conditions for global tumor elimination depending on the ratio between the proliferation rate of the immune cells and their mortality rate. These conditions are described in terms of simple algebraic inequalities imposed on model parameters and treatment parameters. Our theoretical studies of ultimate dynamics are complemented by numerical simulation results.

| | |
|---------------|------------------|
| Date: | October 19, 2017 |
| Place: | Room C1/028 |
| Time: | 12:00 |

