2020 chapter

ICMC SUMMER MEETING
ON DIFFERENTIAL EQUATIONS

3-5 FEBRUARY 2020 | **SÃO CARLOS, SP BRAZIL**
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Celebrating the **60th** birthday of
TOMÁS CARABALLO

LIST OF SESSIONS

Elliptic Equations
Fluid Equations
Linear Equations
Evolution Equations and Applications
Integral and Functional Differential Equations
Boundary Perturbations of Domains for PDEs and Applications
Nonlinear Dynamical Systems
Dispersive Equations
Conservation Laws and Transport Equations
Poster Session

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regarding the set Σ of the *solutions* $(x, \varepsilon, \lambda) \in S \times \mathbb{R} \times \mathbb{R}$ of this problem. Namely, if the operators N and C are compact, under suitable assumptions on a solution $p_* = (x_*, 0, \lambda_*)$ of the unperturbed problem, we prove that the connected component of Σ containing p_* is either unbounded or meets a triple $p^* = (x^*, 0, \lambda^*)$ with $p^* \neq p_*$. When C is the identity and $G = H$ is finite dimensional, the assumptions on $(x_*, 0, \mathbb{1}_*)$ mean that x_* is an eigenvector of L whose corresponding eigenvalue λ_* is simple. Therefore, we extend a previous result obtained by the authors in the finite dimensional setting. Our work is inspired by a paper of R. Chiappinelli concerning the local persistence property of the unit eigenvectors of perturbed self-adjoint operators in a real Hilbert space.

Time-scale analysis for vector-borne diseases with spatial dynamics

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Vector-borne diseases are becoming increasingly widespread in a growing number of countries and it has the potential to get out of control,either associated to changes in vectors habitats, human circulation or climate changes. We use the available dengue incidence and some cell phone data to study, from the dynamical point of view, the spatial-temporal interaction of models that try to adjust to such events. The first challenges are to address the dynamics of the vectors (very fast and local) and the dynamics of humans (very heterogeneous and non-local). The objective is to use the well known Ross-Macdonald models, incorporating spatial movements, identifying different times scales and estimate in a suitable way the parameters.