

Preface

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We are very pleased to present this special issue in *Matemática Contemporânea*. This volume brings together works that were presented at the 13th Americas Conference on Differential Equations and Nonlinear Analysis (XIII Americas) and the ICMC Summer Meeting on Differential Equations–2023 Chapter, held at the Instituto de Ciências Matemáticas e de Computação (ICMC) from University of São Paulo (USP) at São Carlos, Brazil, from January 30 to February 03, 2023. This event, which consists of lecturers, communications, mini-courses and panels, promotes interaction and collaboration among different research groups in differential equations and nonlinear analysis from Brazil and other countries.

The call for papers was made by the ICMC Summer Meeting scientific committee, at the invitation of Professor Jaqueline Mesquita, editor-in-chief of *Matemática Contemporânea*.

This special issue contains seven articles in Differential Equations and Nonlinear Analysis. More precisely, three articles are in the area of Nonlinear Dynamical Systems, one article is in the area of Linear Equations, one article is in the area of Nonlinear Boundary Value Problems, one article is in the area of Harmonic Analysis and Related Topics, and one article is in the area of Domain Perturbations, PDEs and Dynamics.

Concerning the papers in the area of Nonlinear Dynamical Systems, the authors A. Carvalho and A. Oliveira-Sousa investigate the local and global well-posedness of the Navier-Stokes equations in an open, bounded, and smooth subset $\Omega \subset \mathbb{R}^N$ for $N = 2, 3$. The survey presented by J. Simsen concerns results on convergence of the pullback attractor of a nonautonomous problem to the global attractor of the corresponding autonomous problem. In the paper presented by P. Suárez and S. Renteria, the parameter values of a four-dimensional Lorenz-Haken system are characterized such that a zero-Hopf equilibrium point occurs at the singular points, besides proving the existence of periodic orbits bifurcating from these points.

The article in Linear Equations, by I. da Silva and P. da Silva, deals with solvability in Denjoy-Carleman classes of complex vector fields defined on $\Omega = \mathbb{R} \times S^1$, given by $\mathcal{L} = \partial/\partial t + (a(x, t) + ib(x, t))\partial/\partial x$, $b \neq 0$, near the characteristic set $\Sigma = \{0\} \times S^1$.

The article in Nonlinear Boundary Value Problems, by P. Herreros, is a review of recent developments on the multiplicity and uniqueness of radial solutions of the nonlinear elliptic equation $\Delta u + f(u) = 0$, $x \in \mathbb{R}^N$, $N \geq 2$, with $\lim_{|x| \rightarrow \infty} u(x) = 0$, where the nonlinearity f satisfies some appropriate conditions.

The article in Harmonic Analysis and Related Topics, by L. Salge and T. Picon, exhibits a study of the spectrum for an elliptic homogeneous linear differential operator with constant coefficients of order m in n dimensional case on real scales of E -valued localized Sobolev space.

The article in Domain Perturbations, PDEs and Dynamics, by J. Almeida, T. Rodrigues, and Alexys Bruno-Alfonso, makes use of the transfer-matrix method to solve the time-independent Schrödinger equation.

Editorial Board

Everaldo de Mello Bonotto
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Contributed papers

- Navier-Stokes equations: a Millennium Prize Problem from the point of view of continuation of solutions,
Alexandre Nolasco de Carvalho and Alexandre do Nascimento Oliveira Sousa.
- Four-dimensional zero-Hopf bifurcation for a Lorenz-Haken system,
Pedro Iván Suárez Navarro and Sonia Isabel Renteria Alva.
- A survey on asymptotically autonomous evolution processes,
Jacson Simsen.
- A note on solvability of vector fields in Denjoy-Carleman classes,
Isadora Vieira Coelho da Silva and Paulo Leandro Dattori da Silva.
- Multiplicity results for bound state solutions of a semilinear equation,
Pilar Herreros.
- Spectrum of elliptic homogeneous differential operators in dimension n on real scales of localized Sobolev spaces,
Luís Márcio Salge and Tiago Henrique Picon.
- Solving the Schrödinger Equation by the Transfer-Matrix Method,
Juliana Nemezio de Almeida, Tatiana Miguel Rodrigues, and Alexys Bruno-Alfonso.