Communications in **M**athematical **A**nalysis
Volume 14, Number 2, pp. I–II (2012) www.math-res-pub.org/cma
ISSN 1938-9787

PREFACE

This issue of *Communications in Mathematical Analysis* is devoted to various aspects of Analysis, Operator Theory and their applications in problems of Mathematical Physics.

In particular, in this volume there are studied relations between the properties of the radial Toeplitz operators on the unit ball and of the sequences of their eigenvalues, the structure of the poly-Bergman type spaces on the Siegel domain, and the properties of two families of discrete q-extensions of the classical Chebyshev polynomials.

The following problems of mathematical physics are investigated. The spreading rate estimates of soliton perturbations for relativistic nonlinear wave equations are obtained, the existence of transmission eigenvalues for non-regular cases of the scattering problem for the Helmholtz equation is proved, the convergence of Galerkins approximations for the regularized 3D periodic Navier-Stokes equations is established, the asymptotic behavior and stability of solutions to the barotropic vorticity equation on a sphere are studied.

Among of different topics of applications we refer to the formulation of the time-frequency integrals and the stationary phase method in problems of acoustic waves propagation, the numerical study of the behavior of the optical waves in quasi-periodic spherical structures, establishing a long time dynamics for nonlinear Hamilton system of a charged particle in the Klein-Gordon field, and others.

The existence of bang-bang controls with at most n-1 points of switching is established for a class of nonlinear n-dimensional control systems that can be mapped to linear ones by change of variables and an additive change of control. Finally, the asymptotics of European double-barrier option with compound Poisson component is studied.

These papers were presented in the International Workshop "Analysis, Operator Theory, and Mathematical Physics" which was held in Ixtapa (México) in January 23–27, 2012. This workshop was organized by the *Universidad Autónoma del Estado de Morelos* (Cuernavaca, México), *Universidad Michoacana de San Nicolás de Hidalgo* (Morelia, México), *Instituto Politécnico Nacional* (México, D.F.), and *CINVESTAV* (México, D.F.) with assistance of scientific groups from Russia (Moscow) and Poland (Szczecin) that are joined by a scientific project of the so-called "Red de Cuerpos Académicos" with support of the SEP-PROMEP (México).

Editors of the volume:

Prof. Gennadiy Burlak (Autonomous University of the State Morelos, Mexico)

Prof. Yuri Karlovich (Autonomous University of the State Morelos, Mexico)

Prof. Vladimir Rabinovich (National Polytechnic Institute of Mexico)

Table of Contents to Volume 14, Number 2

1. Mesuma Atakishiyeva and Natig Atakishiyev, On Discrete q-Extensions of Chebyshev Polynomials. *Commun. Math. Anal.*, Vol. 14, No. 2 (2012), pp 1-12.
2. Gennadiy Burlak, Valeriy Imaykin, and Anatoli Merzon, Long-Time Decay for the Linearized System of a Charged Particle in the Klein-Gordon Field. *Commun. Math. Anal.*, Vol. 14, No. 2 (2012), pp 13-24.
3. G. Burlak, V. Rabinovich, and J. R. Hernandez Juarez, Time-frequency Integrals and the Stationary Phase Method in Problems of Acoustic Waves Propagation from Moving Sources. *Commun. Math. Anal.*, Vol. 14, No. 2 (2012), pp 25-39.
4. R. Carrada-Herrera, S. M. Grudsky, C. Palomino-Jiménez, and R. M. Porter, Asymptotics of European Double-Barrier Option with Compound Poisson Component. *Commun. Math. Anal.*, Vol. 14, No. 2 (2012), pp 40-66.
5. A. Díaz-de-Anda, G. Burlak, and M. Nájera-Villeda, Optical Fields in a Multilayer Microsphere with a Quasi-periodic Pascal Sequence. *Commun. Math. Anal.*, Vol. 14, No. 2 (2012), pp 67-76.
6. Sergei M. Grudsky, Egor A. Maximenko, and Nikolai L. Vasilevski, Radial Toeplitz Operators on the Unit Ball and Slowly Oscillating Sequences. *Commun. Math. Anal.*, Vol. 14, No. 2 (2012), pp 77-94.
7. E. A. Kopylova, Yu. I. Karlovich, A. I. Komech, and A. E. Merzon, On the Spreading Rate of the Soliton Perturbation for Relativistic Nonlinear Wave Equations. *Commun. Math. Anal.*, Vol. 14, No. 2 (2012), pp 95-102.
8. Valeri V. Kucherenko, On Convergence of Galerkin's Approximations for the Regularized 3D Periodic Navier-Stokes Equations. *Commun. Math. Anal.*, Vol. 14, No. 2 (2012), pp 103-112.
9. Josué Ramírez Ortega, and Armando Sánchez Nungaray, Poly-Bergman Type Spaces on the Siegel Domain. *Commun. Math. Anal.*, Vol. 14, No. 2 (2012), pp 113-128.
10. Valery Serov, Transmission Eigenvalues for Non-regular Cases. *Commun. Math. Anal.*, Vol. 14, No. 2 (2012), pp 129-142.
11. Yuri N. Skiba, Asymptotic Behavior and Stability of Solutions to Barotropic Vorticity Equation on a Sphere. *Commun. Math. Anal.*, Vol. 14, No. 2 (2012), pp 143-162.
12. K. V. Sklyar, G. M. Sklyar, and Yu. I. Karlovich, On Bang-bang Controls for Some Nonlinear Systems. *Commun. Math. Anal.*, Vol. 14, No. 2 (2012), pp 163-178.