

## Preface

This volume contains the proceedings of the conference *Order Analysis and Related Problems of Mathematical Modeling*, which took place at the Vladikavkaz Scientific Center of the Russian Academy of Sciences (Russia) in July 2019. The Conference was jointly organized by the Southern Mathematical Institute of the Vladikavkaz Scientific Centre of the Russian Academy of Sciences and Southern Federal University (Russia) with the support of Ministry of Science and Higher Education of the Russian Federation. Its aim is to make current developments in operator theory and differential equations available to the community as rapidly as possible. Moreover, one of the purposes of this conference was to bring together some young and beginning researchers in order to connect people from different schools and generations, give them the opportunity to exchange ideas, and try to attract more young mathematicians to this fascinating area of research. Among the conference participants were mathematicians from Belarus, China, Germany, Israel, Italy, Iran, Russia, Turkey, UK, USA, Uzbekistan.

The collection presents a wide range of new and interesting problems in operator theory and its applications reflecting the current state of mathematical research in southern Russia. We believe that the reader will find this book to be a delightful and valuable state-of-the-art account on some fascinating areas of operator theory ranging from various classes of operators (positive operators, convolution operators, backward shift operators, singular and fractional integral operators, partial differential operators) to important applications

The articles presented in this collection can be divided into two approximately equal parts. The first part contains articles on general operator theory related to the following topics: positive operators on vector and Banach lattices (Emel'yanov E. Y., Marabeh M. A. A., Pliev M., Polat F.); Boolean valued analysis of operators (Kusraev A. G., Kutateladze S. S.); structural properties of linear operators on spaces of holomorphic and

ultradifferentiable functions (Ivanova O. A, Melikhov S. N., Polyakova D.A.); metric theory of surfaces and Killing vector fields on Riemannian manifolds (Klimentov D. S., Nikonorov Yu. G.); linear operators in approximation theory (Gadzhimirzaev R. M., Magomed-Kasumov M. G., Shakh-Emirov T. N., Sultanakhmedov M.). The second part consists of articles devoted to the extinction in a finite time for a singular parabolic equation on a Riemannian manifold (Andreucci D., Tedeev A.F.); regularity of solutions to the linear singular integral equations (Klimentov S. B.); explicit solutions to Darboux system for the Christoffel symbols (Kulaev R. Ch., Shabat A. B.); spectral analysis of the boundary value problems of incompressible hydrodynamics (Chernish A., Morgulis A. B., Il'in K.) and the energy operator of five-electron system (Tashpulatov S. M.); asymptotics of self-oscillations of viscous incompressible fluid (Revina S.V.); properties of fractional integral operator (Shishkina E. L.); inverse problems for evolution equations (Babich P.V., Levenshtam V.B.), heat conduction and reconstructing the inhomogeneity laws for piecewise gradient functions (Nesterov S. A., Vatulyan A. O., Yurov V. O.); continuous social stratification models (Kazarnikov A.V.).

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