

Operator Theory: Advances and Applications

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Generalized Functions and Fourier Analysis

Dedicated to Stevan Pilipović on the Occasion
of his 65th Birthday

 Birkhäuser

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Preface

In the past decade, the fields of Generalized Functions and Fourier Analysis have converged and made joint progress, notably in the core disciplines of pseudodifferential operators, microlocal analysis and time-frequency analysis. The volume is a compilation of chapters highlighting new developments in the two subjects and their interaction. The focus is on concepts as well as applications in adjacent fields, such as partial differential equations and stochastics. The collection is based on scientific activities related to the International Association for Generalized Functions (IAGF) and the ISAAC interest groups on Pseudo-Differential Operators (IGPDO) and on Generalized Functions (IGGF), notably on the longstanding collaboration of these groups within the International Society for Analysis, Applications and Computation (ISAAC). Indeed, many researchers work in both fields.

This volume is dedicated to Stevan Pilipović at the occasion of his sixty-fifth birthday. Stevan Pilipović is a leading personality in these fields. His research extends through the full range of topics addressed here: from generalized functions, pseudodifferential operators, microlocal analysis, time-frequency analysis, linear, nonlinear and stochastic partial differential equations, stochastic processes, integral equations, to fractional calculus and reaches out as far as mechanics and analytic number theory. With a large number of publications (and an impressive number of co-authors) as well as an equally impressive number of students he has shaped and influenced the fields over a number of generations of mathematicians. Stevan Pilipović is highly appreciated as a scientist, an impressive personality and a dedicated and warm-hearted colleague and supervisor. He has led the analysis branch of the University of Novi Sad through several decades and is also a member of the Serbian Academy of Sciences.

The joint volume is an independent sequel to the volumes “Pseudo-Differential Operators, Generalized Functions and Asymptotics” and “Pseudo-Differential Operators and Generalized Functions”, which collected contributions to the two fields from the ISAAC congresses 2011 in Moscow and 2013 in Krakow, respectively. It contains 16 original research contributions, part of which were presented at the Macau ISAAC Congress 2015, part of which were solicited by the Editors especially for this volume. All papers were peer-reviewed.

The contents of the volume can be roughly categorized in the groups: distribution spaces, operator theory (papers by Ascanelli/Coriasco/Süß, Chen/Signahl/Toft, Sawano, and Yoshino); ultradistributions and microlocal analysis (papers by

Debrouwere, Teofanov/Tomić, and Vučković/Vindas); Colombeau theory (papers by Giordano/Kunzinger, and Vernaev); pseudodifferential operators and microlocal analysis (papers by Popivanov, and Toft); qualitative analysis of partial differential equations (papers by Chung, and Omel'yanov); stochastic differential equations and generalized stochastic processes (papers by Levajković/Mena/Tuffaha, and Baumgartner/Oberguggenberger/Schwarz); and finally, generalized functions and analytic number theory (paper by Debruyne/Vindas).

The editors

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