

1. Record Nr.	UNISA996483172603316
Autore	Sousa Ruben (Mathematician)
Titolo	Convolution-like structures, differential operators and diffusion processes // Ruben Sousa, Manuel Guerra, Semyon Yakubovich
Pubbl/distr/stampa	Cham, Switzerland : , : Springer, , [2022] ©2022
ISBN	3-031-05296-X
Descrizione fisica	1 online resource (269 pages)
Collana	Lecture notes in mathematics ; ; Volume 2315
Disciplina	512.86
Soggetti	Convolutions (Mathematics) Differential operators Diffusion processes Convolucions (Matemàtica) Operadors diferencials Processos de difusió Llibres electrònics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Intro -- Preface -- Contents -- List of Symbols -- 1 Introduction -- 1.1 Motivation and Scope -- 1.2 Organization of the Book -- 2 Preliminaries -- 2.1 Continuous-Time Markov Processes -- 2.2 Sturm-Liouville Theory -- 2.2.1 Solutions of the Sturm-Liouville Equation -- 2.2.2 Eigenfunction Expansions -- 2.2.3 Diffusion Semigroups Generated by Sturm-Liouville Operators -- 2.2.4 Remarkable Particular Cases -- 2.3 Generalized Convolutions and Hypergroups -- 2.4 Harmonic Analysis with Respect to the Kingman Convolution -- 3 The Whittaker Convolution -- 3.1 A Special Case: The Kontorovich-Lebedev Convolution -- 3.2 The Product Formula for the Whittaker Function -- 3.3 Whittaker Translation -- 3.4 Index Whittaker Transforms -- 3.5 Whittaker Convolution of Measures -- 3.5.1 Infinitely Divisible Distributions -- 3.5.2 Lévy-Khintchine Type Representation -- 3.6 Lévy Processes with Respect to the Whittaker Convolution -- 3.6.1 Convolution Semigroups -- 3.6.2 Lévy and Gaussian Processes -- 3.6.3 Some Auxiliary Results on the Whittaker Translation -- 3.6.4 Moment

Functions -- 3.6.5 Lévy-Type Characterization of the Shiryaev Process -- 3.7 Whittaker Convolution of Functions -- 3.7.1 Mapping Properties in the Spaces  $L_p(r)$  -- 3.7.2 The Convolution Banach Algebra  $L$ , -- 3.8 Convolution-Type Integral Equations -- 4 Generalized Convolutions for Sturm-Liouville Operators -- 4.1 Known Results and Motivation -- 4.2 Laplace-Type Representation -- 4.3 The Existence Theorem for Sturm-Liouville Product Formulas -- 4.3.1 The Associated Hyperbolic Cauchy Problem -- 4.3.2 The Time-Shifted Product Formula -- 4.3.3 The Product Formula for  $w$  as the Limit Case -- 4.4 Sturm-Liouville Transform of Measures -- 4.5 Sturm-Liouville Convolution of Measures -- 4.5.1 Infinite Divisibility and Lévy-Khintchine Type Representation -- 4.5.2 Convolution Semigroups. 4.5.3 Additive and Lévy Processes -- 4.6 Sturm-Liouville Hypergroups -- 4.6.1 The Nondegenerate Case -- 4.6.2 The Degenerate Case: Degenerate Hypergroups of Full Support -- 4.7 Harmonic Analysis on  $L_p$  Spaces -- 4.7.1 A Family of  $L_1$  Spaces -- 4.7.2 Application to Convolution-Type Integral Equations -- 5 Convolution-Like Structures on Multidimensional Spaces -- 5.1 Convolutions Associated with Conservative Strong Feller Semigroups -- 5.2 Nonexistence of Convolutions: Diffusion Processes on Bounded Domains -- 5.2.1 Special Cases and Numerical Examples -- 5.2.2 Some Auxiliary Results -- 5.2.3 Eigenfunction Expansions, Critical Points and Nonexistence Theorems -- 5.3 Nonexistence of Convolutions: One-Dimensional Diffusions -- 5.4 Families of Convolutions on Riemannian Structures with Cone-Like Metrics -- 5.4.1 The Eigenfunction Expansion of the Laplace-Beltrami Operator -- 5.4.2 Product Formulas and Convolutions -- 5.4.3 Infinitely Divisible Measures and Convolution Semigroups -- 5.4.4 Special Cases -- 5.4.5 Product Formulas and Convolutions Associated with Elliptic Operators on Subsets of  $\mathbb{R}^2$  -- A Some Open Problems -- References -- Index.

---