

Contents

1	Two-Parameter Martingales and Their Properties	1
1.1	Definitions and Global Properties	1
1.2	Stochastic Two-Parametric Integrals	18
1.3	Stochastic Measures and Integrals for Nonrandom Functions	29
2	Stochastic Differential Equations on the Plane	37
2.1	Ito and Diffusion-Type Stochastic Fields	37
2.2	Strong Solution of Stochastic Differentiation Equations	44
2.3	Generalized Girsanov Theorem for Stochastic Fields on the Plane	47
2.4	Some Properties of Measures Corresponding to Random Fields on the Plane	62
2.5	Nonparametric Estimation of a Two-Parametrical Signal from Observation with Additive Noise	77
2.6	Identification Problem for Stochastic Fields	87
3	Filtration and Prediction Problems for Stochastic Fields	93
3.1	Filtration Problem for Partly Observed Random Fields	93
3.2	Filtration Problem for Stochastic Fields Observed in the Half-Space	102
3.3	Innovation Method for Filtration Problems	108
3.4	Filtration Problem for Stochastic Fields Described by Parabolic Equations with Given Boundary Conditions	116
3.5	Duality of Filtration and Control Problems	122
3.6	Prediction Problem for Stochastic Fields	130
4	Control Problem for Diffusion-Type Random Fields	135
4.1	Existence of an Optimal Control	135
4.2	Construction of an ε -Optimal Control for Diffusion-Type Random Fields	143

5 Stochastic Processes in a Hilbert Space	155
5.1 Ito Processes and Diffusion-Type Processes in a Hilbert Space	155
5.2 Filtration of Ito Processes in a Hilbert Space	163
5.3 Controlled Stochastic Differential Equations in a Hilbert Space	167
References	177
Index	181

Estimation and Control Problems for Stochastic Partial
Differential Equations

Knopov, P.S.; Deriyeva, O.N.

2013, X, 183 p., Hardcover

ISBN: 978-1-4614-8285-7