Theory of Probability and Mathematical Statistics

Number 83 2011

A Translation of

ТЕОРІЯ ЙМОВІРНОСТЕЙ ТА МАТЕМАТИЧНА СТАТИСТИКА

ВИПУСК 83 2010



American Mathematical Society

Providence, Rhode Island USA ISSN 0094-9000

THEORY OF PROBABILITY AND MATHEMATICAL STATISTICS

A translation of

ТЕОРІЯ ЙМОВІРНОСТЕЙ ТА МАТЕМАТИЧНА СТАТИСТИКА

Originally published in Ukrainian by TBiMC.

© TBiMC, 2010

© Київський університет, 2010

Editorial Board

- A. V. Skorokhod (Editor-in-Chief)
- Yu. V. Kozachenko (Deputy Editor-in-Chief)

L. M. Sakhno (Executive Secretary)

V. V. Anīsīmov	Yu. S. Mishura
V. V. Buldygin	M. P. Moklyachuk
O. V. Ivanov	M. I. Portenko
N. V. Kartashov	E. Seneta
V. S. Korolyuk	D. S. Sil'vestrov
M. M. Leonenko	O. K. Zakusilo

SUBSCRIPTION INFORMATION. The 2011 subscription is for Numbers 82 and 83. Beginning in 2004, Theory of Probability and Mathematical Statistics is accessible from www.ams.org/journals/. Subscription prices for 2011 are as follows: for paper delivery, US\$751 list; US\$600.80 institutional member; for electronic delivery, US\$676 list, US\$540.80 institutional member. Upon request, subscribers to paper delivery of this journal are also entitled to receive electronic delivery. For paper delivery, subscribers outside the United States and India must pay a postage surcharge of US\$7; subscribers in India must pay a postage surcharge of US\$13. Expedited delivery to destinations in North America US\$10; elsewhere US\$25. Subscription renewals are subject to late fees. See www.ams.org/journal-faq for more journal subscription information. BACK NUMBER INFORMATION. For back issues see www.ams.org/bookstore.

Subscriptions and orders should be addressed to American Mathematical Society, P.O. Box 845904, Boston, MA 02284-5904, USA. *All orders must be accompanied by payment*. Other correspondence should be addressed to 201 Charles Street, Providence, RI 02904-2294, USA.

COPYING AND REPRINTING. Material in this journal may be reproduced by any means for educational and scientific purposes without fee or permission with the exception of reproduction by services that collect fees for delivery of documents and provided that the customary acknowledgment of the source is given. This consent does not extend to other kinds of copying for general distribution, for advertising or promotional purposes, or for resale. Requests for permission for commercial use of material should be addressed to the Acquisitions Department, American Mathematical Society, 201 Charles Street, Providence, Rhode Island 02904-2294, USA. Requests can also be made by e-mail to reprint-permission@ams.org.

Theory of Probability and Mathematical Statistics (ISSN 0094-9000) is published by the American Mathematical Society, 201 Charles Street, Providence, RI 02904-2294, USA and is mailed from Providence, Rhode Island. Postmaster: Send address changes to Theory of Probability and Mathematical Statistics, American Mathematical Society, 201 Charles Street, Providence, RI 02904-2294, USA.

 © 2011, American Mathematical Society. All rights reserved.
This journal is indexed in *Mathematical Reviews* and *Zentralblatt MATH*. This journal is archived in *Portico*.
Printed in the United States of America.
The paper used in this journal is acid-free and falls within the guidelines established to ensure permanence and durability.

 $10 \ 9 \ 8 \ 7 \ 6 \ 5 \ 4 \ 3 \ 2 \ 1 \qquad 16 \ 15 \ 14 \ 13 \ 12 \ 11$



The members of the Department of Probability Theory, Statistics, and Actuarial Mathematics of the Faculty for Mechanics and Mathematics of Kyiv National Taras Shevchenko University, and the Editorial Board of the journal *Theory of Probability and Mathematical Statistics* congratulate Deputy Editor-in-Chief of the journal, winner of the State Prize of Ukraine in Science and Technology, Honored Scientist of Ukraine, Professor **Yuriĭ Vasyl'ovich Kozachenko** on the occasion of his 70th birthday and wish him robust health and creative longevity.

Theory of Probability and Mathematical Statistics

Number 83 2011

A Translation of

ТЕОРІЯ ЙМОВІРНОСТЕЙ ТА МАТЕМАТИЧНА СТАТИСТИКА

ВИПУСК 83 2010



American Mathematical Society

Providence, Rhode Island USA ISSN 0094-9000

THEORY OF PROBABILITY AND MATHEMATICAL STATISTICS

A translation of

ТЕОРІЯ ЙМОВІРНОСТЕЙ ТА МАТЕМАТИЧНА СТАТИСТИКА

Originally published in Ukrainian by TBiMC.

© TBiMC, 2010

© Київський університет, 2010

Editorial Board

- A. V. Skorokhod (Editor-in-Chief)
- Yu. V. Kozachenko (Deputy Editor-in-Chief)

L. M. Sakhno (Executive Secretary)

V. V. Anīsīmov	Yu. S. Mishura
V. V. Buldygin	M. P. Moklyachuk
O. V. Ivanov	M. I. Portenko
N. V. Kartashov	E. Seneta
V. S. Korolyuk	D. S. Sil'vestrov
M. M. Leonenko	O. K. Zakusilo

SUBSCRIPTION INFORMATION. The 2011 subscription is for Numbers 82 and 83. Beginning in 2004, Theory of Probability and Mathematical Statistics is accessible from www.ams.org/journals/. Subscription prices for 2011 are as follows: for paper delivery, US\$751 list; US\$600.80 institutional member; for electronic delivery, US\$676 list, US\$540.80 institutional member. Upon request, subscribers to paper delivery of this journal are also entitled to receive electronic delivery. For paper delivery, subscribers outside the United States and India must pay a postage surcharge of US\$7; subscribers in India must pay a postage surcharge of US\$13. Expedited delivery to destinations in North America US\$10; elsewhere US\$25. Subscription renewals are subject to late fees. See www.ams.org/journal-faq for more journal subscription information. BACK NUMBER INFORMATION. For back issues see www.ams.org/bookstore.

Subscriptions and orders should be addressed to American Mathematical Society, P.O. Box 845904, Boston, MA 02284-5904, USA. *All orders must be accompanied by payment*. Other correspondence should be addressed to 201 Charles Street, Providence, RI 02904-2294, USA.

COPYING AND REPRINTING. Material in this journal may be reproduced by any means for educational and scientific purposes without fee or permission with the exception of reproduction by services that collect fees for delivery of documents and provided that the customary acknowledgment of the source is given. This consent does not extend to other kinds of copying for general distribution, for advertising or promotional purposes, or for resale. Requests for permission for commercial use of material should be addressed to the Acquisitions Department, American Mathematical Society, 201 Charles Street, Providence, Rhode Island 02904-2294, USA. Requests can also be made by e-mail to reprint-permission@ams.org.

Theory of Probability and Mathematical Statistics (ISSN 0094-9000) is published by the American Mathematical Society, 201 Charles Street, Providence, RI 02904-2294, USA and is mailed from Providence, Rhode Island. Postmaster: Send address changes to Theory of Probability and Mathematical Statistics, American Mathematical Society, 201 Charles Street, Providence, RI 02904-2294, USA.

 © 2011, American Mathematical Society. All rights reserved.
This journal is indexed in *Mathematical Reviews* and *Zentralblatt MATH*. This journal is archived in *Portico*.
Printed in the United States of America.
The paper used in this journal is acid-free and falls within the guidelines established to ensure permanence and durability.

 $10 \ 9 \ 8 \ 7 \ 6 \ 5 \ 4 \ 3 \ 2 \ 1 \qquad 16 \ 15 \ 14 \ 13 \ 12 \ 11$

CONTENTS

Ch. A. Agayeva, Second order necessary conditions of optimality for stochastic	
systems with variable delay	1
O. L. Banna and Yu. S. Mishura, A bound for the distance between fractional	
Brownian motion and the space of Gaussian martingales on an interval	13
T. Bodnar and T. Zabolotskyy, Estimation and inference of the vector	
autoregressive process under heteroscedasticity	27
D. S. Budkov and S. Ya. Makhno, Law of the iterated logarithm for solutions	
of stochastic equations	47
Rita Giuliano, Weak convergence of sequences from fractional parts of random	
variables and applications	59
O. E. Kamenshchikova and T. O. Yanevich, An approximation of $L_p(\Omega)$	
processes	71
Yu. M. Kartashov, Limit theorems for difference additive functionals	83
Yu. V. Kozachenko and O. M. Moklyachuk, Sample continuity and modeling	
of stochastic processes from the spaces D_{VW}	95
Yu. S. Mishura, S. V. Posashkova, and S. V. Posashkov, Continuous	
dependence of solutions of stochastic differential equations driven by standard	
and fractional Brownian motion on a parameter	111
A. A. Pogorui and Ramón M. Rodríguez-Dagnino, Asymptotic expansion	
for transport processes in semi-Markov media	127
M. S. Pupashenko. Convergence of reward functionals in a reselling model for a	
European option	135
M. K. Runovska, Convergence of series of Gaussian Markov sequences	149
Georgii Shevchenko. Properties of trajectories of a multifractional Rosenblatt	
process	163
S. V. Shklvar. Conditions for the consistency of the total least squares estimator	
in an errors-in-variables linear regression model	175
R. E. Yamnenko and O. S. Shramko . On the distribution of storage processes	-
from the class $V(\varphi, \psi)$	191
$X U \neq U Z$	-

UKRAINIAN CONTENTS*

Ch. A. Agayeva	
Second order necessary conditions of optimality for stochastic systems with variable delay	2
О. Л. Банна, Ю. С. Мішура Оцінка відстані між дробовим броунівським рухом і простором гаус- сових мартингалів на відрізку	12
T. Bodnar, T. Zabolotskyy Estimation and inference of the vector autoregressive process under het- eroscedasticity	22
Д. С. Будков, С. Я. Махно Закон повторного логарифма для решений стохастических уравне- ний	39
Rita Giuliano	
Weak convergence of sequences from fractional parts of random variables and applications	49
О. Є. Каменщикова, Т. О. Яневич Апроксимація $L_p(\Omega)$ -процесів	59
Ю. М. Карташов Граничні теореми для різницевих адитивних функціоналів	69
Ю. В. Козаченко, О. М. Моклячук Вибіркова неперервність та моделювання випадкових процесів з про- сторів $D_{V,W}$	80
<i>Ю. С. Мішура, С. В. Посашкова, С. В. Посашков</i> Неперервна залежність від параметру розв'язків стохастичних ди- форонцірницих рівняци, коровраних стандартних та пробовни бро	
усрепциятыних рынянь, керованих стандартним та дросовим оро-	92
A. A. Pogorui, Ramón M. Rodríguez-Dagnino Asymptotic expansion for transport processes in semi-Markov media	106
М. С. Пупашенко	
Збіжність функціоналів винагород у конкретній моделі перепродажу опціону європейського типу	113
М. К. Руновська	
Зоіжність рядів, складених з елементів гауссівських марковських послідовностей	125
Георгій Шевченко	
Властивості траєкторій мультидробового процесу Розенблатта	138

 $^{^*}$ The American Mathematical Society scheme for transliteration of Cyrillic may be found at the end of index issues of *Mathematical Reviews*.

С. В. Шкляр	
Умови конзистентності оцінки найменших квадратів у всіх змінних	
у моделі векторної лінійної регресії з похибками в змінних	148
Р. Є. Ямненко, О. С. Шрамко	
Про розподіл процесів накопичення з класу $V(arphi,\psi)$	163

