

**ON ASYMPTOTIC BOROVKOV-SAKHANENKO INEQUALITY WITH
UNBOUNDED PARAMETER SET**

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ABSTRACT. Integral analogues of Cramér-Rao's inequalities for Bayesian parameter estimators proposed initially by Schützenberger (1958) and later by van Trees (1968) were further developed by Borovkov and Sakhanenko (1980). In this paper, new asymptotic versions of such inequalities are established under ultimately relaxed regularity assumptions and under a locally uniform nonvanishing of the prior density and with \mathbf{R}^1 as a parameter set. Optimality of Borovkov-Sakhanenko's asymptotic lower bound functional is established.

**APPROXIMATION OF A WIENER PROCESS BY INTEGRALS WITH
RESPECT TO THE FRACTIONAL BROWNIAN MOTION OF POWER
FUNCTIONS OF A GIVEN EXPONENT**

O. L. BANNA, YU. S. MISHURA, S. V. SHKLYAR

ABSTRACT. The best uniform approximation of a Wiener process by integrals of the form

$$\int_0^t f(s) dB_s^H$$

is established in the space $L_\infty([0, T]; L_2(\Omega))$, where $\{B_t^H, t \in [0, T]\}$ is the fractional Brownian motion with the Hurst index H and $f(s) = k \cdot s^\alpha$, $s \in [0, T]$, for $k > 0$ and $\alpha = H - 1/2$.

**AN ESTIMATE OF THE RATE OF CONVERGENCE OF A SEQUENCE OF
ADDITIVE FUNCTIONALS OF DIFFERENCE APPROXIMATIONS FOR A
MULTIDIMENSIONAL DIFFUSION PROCESS**

IU. V. GANYCHENKO

ABSTRACT. We consider a sequence of additive functionals of difference approximations for a multidimensional diffusion. A result by A. M. Kulik, *Difference approximation for local times of multidimensional diffusions*, Theory Probab. Math. Statist. **78** (2008), 67-83, on sufficient conditions for such a sequence to converge weakly to a W -functional of the limit process is improved. An estimate of the rate of convergence is obtained.

**AN INEQUALITY FOR THE COUPLING MOMENT IN THE CASE OF TWO
INHOMOGENEOUS MARKOV CHAINS**

V. V. GOLOMOZYĬ

ABSTRACT. We consider discrete Markov chains with phase space $\{0, 1, \dots\}$ and study conditions under which the expectation of the first coupling moment for two independent discrete time inhomogeneous Markov chains is finite. The coupling moment is defined as the first time when both chains simultaneously visit the zero state. Some special cases are considered where a bound for the expectation of the coupling moment is available.

**ESTIMATION OF PARAMETERS OF A MIXTURE OF TWO SYMMETRIC
DISTRIBUTIONS FROM A BIASED SAMPLE**

T. GORBACH

ABSTRACT. We consider a biased sample from a mixture of two symmetric distributions that differ by a shift parameter. The method of moments and the generalized estimating equations method are used to estimate unknown parameters. Adaptive estimators are constructed by using the estimators of optimal estimating functions and those obtained by the method of moments. The asymptotic behavior of GEE-estimators and adaptive estimators is investigated.

**LOWER BOUND FOR A DISPERSION MATRIX FOR THE
SEMIPARAMETRIC ESTIMATION IN A MODEL OF MIXTURES**

O. V. DORONIN

ABSTRACT. The model of mixtures with varying concentrations is discussed. The parameterization of the first K of M components is considered. The semiparametric estimation technique based on the method of generalized estimating equations is considered. The consistency and asymptotic normality of estimators are proved. A lower bound for the dispersion matrix is found.

**STOCHASTIC ASYMPTOTIC EXPANSION OF CORRELOGRAM
ESTIMATOR OF THE CORRELATION FUNCTION OF RANDOM NOISE IN
NONLINEAR REGRESSION MODEL**

O. V. IVANOV, K. K. MOSKVICHOVA

ABSTRACT. A correlogram estimator of the covariance function of a stationary Gaussian noise is considered in a nonlinear regression model with continuous time. The estimator is constructed from deviations of the observed stochastic process from the regression function where the least squares estimator is substituted for the unknown parameter. A stochastic asymptotic expansion of the correlogram estimator of the covariance function is obtained for the case where the time of observations tends to infinity.

**TWO COMPONENT BINARY STATISTICAL EXPERIMENTS WITH
PERSISTENT LINEAR REGRESSION**

D. V. KOROLIUK

ABSTRACT. A sequence of binary statistical experiments generated by a sample of random variables with persistent linear regression is studied. A stochastic approximation for a sequence of statistical experiments is constructed in terms of an autoregressive process with normal noise. For a sequence of exponential statistical experiments, a stochastic approximation is constructed, as well, with the help of an exponential normal autoregressive process.

**ASYMPTOTIC BEHAVIOR OF THE MARTINGALE TYPE INTEGRAL
FUNCTIONALS FOR UNSTABLE SOLUTIONS TO STOCHASTIC
DIFFERENTIAL EQUATIONS**

G. L. KULINICH, S. V. KUSHNIRENKO, YU. S. MISHURA

ABSTRACT. We consider functionals of the type $\int_0^t g(\xi(s)) dW(s)$, $t \geq 0$. Here g is a real valued and locally square integrable function, ξ is a unique strong solution of the Itô stochastic differential equation $d\xi(t) = a(\xi(t)) dt + dW(t)$, a is a measurable real valued bounded function such that $|xa(x)| \leq C$. The behavior of these functionals is studied as $t \rightarrow \infty$. The appropriate normalizing factor and the explicit form of the limit random variable are established.

**LARGE DEVIATIONS FOR SOLUTIONS OF ONE DIMENSIONAL ITÔ
EQUATIONS**

A. V. LOGACHOV

ABSTRACT. The large deviations principle for the sequence of stochastic processes

$$\eta_n(t) = x_0 + \int_0^t b(n\eta_n(s)) ds + \frac{1}{\varphi(n)} \int_0^t \sigma(n\eta_n(s)) dw(s)$$

is proved if the limits of integral means exist for the functions $b(x)\sigma^{-2}(x)$ and $\sigma^{-2}(x)$. The rate functional is evaluated.

**NORMAL LIMITING DISTRIBUTION OF THE NORMALIZED NUMBER OF
EXTRANEOUS SOLUTIONS OF A COMPATIBLE SYSTEM OF NONLINEAR
RANDOM EQUATIONS OVER THE FIELD $\text{GF}(2)$**

V. I. MASOL, S. YA. SLOBODYAN

ABSTRACT. Conditions are presented under which the distribution of the properly normalized number of extraneous solutions of a system of compatible random equations over the field $\text{GF}(2)$ tends to a standard normal distribution.

ON A SINGLE-SERVER QUEUEING SYSTEM WITH REFUSAL

I. K. MATSAK

ABSTRACT. A single-server queueing system is considered with refusal of a general type. Stationary probabilities are found and the central limit theorem is established for the sojourn time.

**COMPARISON THEOREM FOR SOLUTIONS OF PARABOLIC
STOCHASTIC EQUATIONS WITH AN ABSORBER**

S. A. MEL'NIK

ABSTRACT. A comparison theorem is proved for solutions of the Cauchy problem for a quasi-linear parabolic stochastic equation. The drift and diffusion coefficients of this equation do not necessarily satisfy the Lipschitz condition. The drift coefficient is assumed to be an absorber.

**MOMENT MEASURES OF MIXED EMPIRICAL RANDOM POINT
PROCESSES AND MARKED POINT PROCESSES IN COMPACT METRIC
SPACES. 2**

M. G. SEMEÏKO

ABSTRACT. This is a continuation of the paper by M. G. Semeïko, *Moment measures of mixed empirical random point processes and marked point processes in compact metric spaces. I*, Theor. Probability and Math. Statist. **88** (2014), 161-174. Moment measures of mixed empirical marked random point processes are investigated by using the probability generating functions of random counting measures.

**ACCURACY AND RELIABILITY OF A MODEL FOR A GAUSSIAN
HOMOGENEOUS AND ISOTROPIC RANDOM FIELD IN THE SPACE $L_P(\mathbb{T})$,
 $P \geq 1$**

N. V. TROSHKI

ABSTRACT. A model is constructed for a Gaussian homogeneous isotropic random field that approximates it with a given accuracy and reliability in the space $L_p(T)$, $p \geq 1$. The theory of the spaces $\text{Sub}(\Omega)$ is used for studying such a model.

**CONVERGENCE OF A SEQUENCE OF NEARLY CRITICAL BRANCHING
PROCESSES WITH IMMIGRATION**

YA. M. KHUSANBAEV

ABSTRACT. We study a sequence of nearly critical branching processes with immigration in the case where the rate of convergence of the expectation of the number of offsprings to 1 is slower than n^{-1} . We provide sufficient conditions under which these processes converge in probability to a nonrandom process and prove a limit theorem for the fluctuations of nearly critical branching processes.

**CONVERGENCE OF STOCHASTIC INTEGRALS TO A CONTINUOUS
LOCAL MARTINGALE WITH CONDITIONALLY INDEPENDENT
INCREMENTS**

ANDRIY YURACHKIVSKY

ABSTRACT. For each $T > 0$, let a tensor-valued stochastic process Y_T be defined by

$$Y_T(t) = \int_0^t DZ_T(s) \otimes \vartheta_T(s),$$

where Z_T is an \mathbf{R}^d -valued locally square integrable martingale with respect to some filtration \mathbb{F}_T and where ϑ_T is an \mathbf{R}^d -valued \mathbb{F}_T -predictable stochastic process such that $\int_0^t |\vartheta_T(s)|^2 D \text{tr} \langle Z_T \rangle (s) < \infty$ for all t . In this paper, conditions are found for the convergence $(Y_T, \langle Y_T \rangle) \xrightarrow{\text{law}} (Y, \langle Y \rangle)$, where Y is a continuous local martingale with conditionally independent increments given $\langle Y \rangle$.