

THE ANNALS  
*of*  
PROBABILITY

*AN OFFICIAL JOURNAL OF*  
THE INSTITUTE OF MATHEMATICAL STATISTICS

VOLUME 2

1974

## CONTENTS OF VOLUME 2

### ARTICLES AND SHORT COMMUNICATIONS

ATHREYA, K. AND NEY, P. Functionals of critical multitype branching processes . . . . .	339–343
AHLSWEDE, R. The capacity region of a channel with two senders and two receivers . . . . .	805–814
BALKEMA, A. A. AND DE HAAN, L. Residual life time at great age . . . . .	792–804
BASU, SUJIT K. Density versions of the univariate central limit theorem . . . . .	270–276
BECK, ANATOLE AND WARREN, PETER. Strong laws of large numbers for weakly orthogonal sequences of Banach space-valued random variables . . . . .	918–925
BERMAN, SIMEON N. A Gaussian paradox: determinism and discontinuity of sample functions . . . . .	950–953
BERMAN, SIMEON M. Sojourns and extremes of Gaussian processes . . . . .	999–1026
BILLINGSLEY, PATRICK. A note on separable stochastic processes . . . . .	476–479
BILLINGSLEY, PATRICK. Conditional distributions and tightness . . . . .	480–485
BILLINGSLEY, PATRICK. The probability theory of additive arithmetic functions . . . . .	749–791
BLACKWELL, D., FREEDMAN, D. AND ORKIN, M. The optimal reward operator in dynamic programming . . . . .	926–941
BRILLINGER, DAVID R. Cross-spectral analysis of processes with stationary increments including the stationary $G/G/\infty$ queue . . . . .	815–827
BRUNEL, A. AND REVUZ, D. Un critère probabiliste de compacité des groupes . . . . .	745–746
CHAMBERLAIN, MICHAEL W. The excessive functions of a continuous time Markov chain . . . . .	1075–1089
CHAN, Y. K. Notes on constructive probability theory . . . . .	51–75
CHAN, Y. K. On constructive convergence of measures on the real line . . . . .	131–135
CHEN, LOUIS H. Y. On the convergence of Poisson binomial to Poisson distributions . . . . .	178–180
DAVIS, M. H. A. AND VARAIYA, P. The multiplicity of an increasing family of $\sigma$ -fields . . . . .	958–963
DE HAAN, LAURENS. On random indices and limit distributions . . . . .	181
DE HAAN, L. AND BALKEMA, A. A. Residual life time at great age . . . . .	792–804
DE LA VEGA, W. FERNANDEZ. On almost sure convergence of quadratic Brownian variation . . . . .	551–552
DEO, CHANDRAKANT M. A note on stationary Gaussian sequences . . . . .	954–957
DOKSUM, KJELL. Tailfree and neutral random probabilities and their posterior distributions . . . . .	183–201
DRISCOLL, M. F., McDONALD, J. N. AND WEISS, N. A. LLN for weakly stationary processes on locally compact Abelian groups . . . . .	1168–1171

DUBINS, LESTER E. On Lebesgue-like extensions of finitely additive measures . . . . .	456-463
DUBINS, LESTER E. AND MEILIJSOHN, ISAAC. On stability for optimization problems . . . . .	243-255
ERDÖS, P. AND NEY, P. Some problems on random intervals and annihilating particles . . . . .	828-839
ERICKSON, K. BRUCE AND KESTEN, HARRY. Strong and weak limit points of a normalized random walk . . . . .	553-579
ERICKSON, R. V. $L_1$ bounds for asymptotic normality of $m$ -dependent sums using Stein's technique . . . . .	522-529
FREEDMAN, DAVID. A remark on the strong law . . . . .	324-327
FREEDMAN, DAVID. The optimal reward operator in special classes of dynamic programming problems . . . . .	942-949
FREEDMAN, DAVID. The Poisson approximation for dependent events . . . . .	256-269
FREEDMAN, D., ORKIN, M. AND BLACKWELL, D. The optimal reward operator in dynamic programming . . . . .	926-941
GINÉ M., EVARIST. On the central limit theorem for sample continuous processes . . . . .	629-641
GREENWOOD, PRISCILLA. The martintote . . . . .	84-89
GRIFFEATH, DAVID AND SNELL, J. LAURIE. Optimal stopping in the stock market . . . . .	1-13
GRIMVALL, ANDERS. On the convergence of sequences of branching processes . . . . .	1027-1045
GUESS, HARRY A. Limit theorems for some stochastic evolution models . . . . .	14-31
GUT, ALLAN. On convergence in $r$ -mean of some first passage times and randomly indexed partial sums . . . . .	321-323
GUT, ALLAN. On the moments and limit distributions of some first passage times . . . . .	277-308
HAMMERSLEY, J. M. Postulates for subadditive processes . . . . .	652-680
HARRIS, T. E. Contact interactions on a lattice . . . . .	969-988
HARTMAN, PHILIP AND WATSON, GEOFFREY. "Normal" distribution functions on spheres and the modified Bessel functions . . . . .	593-607
HEYDE, C. C. An iterated logarithm result for autocorrelation of a stationary linear process . . . . .	328-332
IGLEHART, DONALD L. Functional central limit theorems for random walks conditioned to stay positive . . . . .	608-619
JOFFE, A. On a set of almost determinable $k$ -independent random variables . . . . .	161-162
KALLENBERG, OLAV. Series of random processes without discontinuities of the second kind . . . . .	729-737
KAPLAN, NORMAN. A note on the supercritical branching processes with random environments . . . . .	509-514
KAPLAN, NORMAN. Some results about multidimensional branching processes with random environments . . . . .	441-455

KEILSON, JULIAN AND STEUTEL, F. W. Mixtures of distributions, moment inequalities and measures of exponentiality and normality . . . . .	112-130
KERTZ, ROBERT P. Limit theorems for discontinuous random evolutions with applications to initial value problems and to Markov processes on $N$ lines . . . . .	1045-1064
KESTEN, HARRY. Renewal theory for functionals of a Markov chain with general state space . . . . .	355-386
KESTEN, HARRY AND ERICKSON, K. BRUCE. Strong and weak limit points of a normalized random walk . . . . .	553-579
KIEFFER, J. C. On the approximation of stationary measures by periodic and ergodic measures . . . . .	530-534
KLAASS, MICHAEL J. On stopping rules and the expected supremum of $S_n/a_n$ and $ S_n /a_n$ . . . . .	889-905
KOOPMANS, L. H., MARTIN, N., PATHAK, P. K. AND QUALLS, C. On the divergence of a certain random series . . . . .	546-550
KOSTKA, DAVID G. Lower class sequences for the Skorohod-Strassen approximation scheme . . . . .	1172-1178
KUDŌ, HIROKICHI. A note on the strong convergence of $\sigma$ -algebras . . . . .	76-83
KUELBS, J. AND KURTZ, T. Berry-Esséen estimates in Hilbert space and an application to the law of the iterated logarithm . . . . .	387-407
KUNTZ, AMY J. Groups of transformations without finite invariant measures have strong generators of size 2 . . . . .	143-146
KURTZ, T. AND KUELBS, J. Berry-Esséen estimates in Hilbert space and an application to the law of the iterated logarithm . . . . .	387-407
KUSHNER, HAROLD J. On the weak convergence of interpolated Markov chains to a diffusion . . . . .	40-50
LAI, TZE LEUNG. Limit theorems for direct sums . . . . .	432-440
LAI, TZE LEUNG. Martingales and boundary crossing probabilities for Markov processes . . . . .	1152-1167
LEE, WANG CHUNG. Random stirring of the real line . . . . .	580-592
LEMOINE, AUSTIN J. A simple proof of a known result in random walk theory . . . . .	347-348
LIGGETT, THOMAS M. Convergence to local occupancy in an infinite particle system with interactions . . . . .	989-998
LIN, MICHAEL. On quasi-compact Markov operators . . . . .	464-475
LINDGREN, GEORG. A note on the asymptotic independence of high level crossings for dependent Gaussian processes . . . . .	535-539
LINDVALL, TORGNY. Almost sure convergence of branching processes in varying random environments . . . . .	344-346
MALLER, R. A. A remark on local behavior of characteristic functions	
MALLER, R. A. On symmetric moments and local behavior of the characteristic function . . . . .	1185-1187
MARCUS, M. B. Asymptotic maxima of continuous Gaussian processes	173-177
MARTIN, N., PATHAK, P. K., QUALLS, C. AND KOOPMANS, L. H. On the divergence of a certain random series . . . . .	702-713
MARTIN, N. F. G. The Rosenblatt mixing condition and Bernoulli shifts . . . . .	546-550
	333-338

McDONALD, J. N., WEISS, N. A. AND DRISCOLL, M. F. LLN for weakly stationary processes on locally compact Abelian groups.....	1168-1171
MCLEISH, D. L. Dependent central limit theorems and invariance principles.....	620-628
MEILIJSON, ISAAC AND DUBINS, LESTER E. On stability for optimization processes.....	243-255
MICHEL, R. Results on probabilities of moderate deviations.....	349-353
MINEKA, J. A stable local limit theorem.....	167-172
MITTAL, YASH. Limiting behavior of maxima in stationary Gaussian sequences.....	231-242
MYERS, LAWRENCE E. A random walk with nearly uniform $N$ -step motion.....	32-39
NEY, P. AND ATHREYA, K. Functionals of critical multitype branching processes.....	339-343
NEY, P. AND ERDÖS, P. Some problems on random intervals and annihilating particles.....	828-839
NORMAN, M. FRANK. A central limit theorem for Markov processes that move by small steps.....	1065-1074
O'BRIEN, G. L. Limit theorems for the maximum term of a stationary process.....	540-545
O'BRIEN, GEORGE. The limiting distribution of maxima of random variables defined on a denumerable Markov chain.....	103-111
O'REILLY, NEVILLE E. On Sawyer's rates of convergence for some functionals in probability.....	1179-1184
O'REILLY, NEVILLE E. On the weak convergence of empirical processes in sup-norm metrics.....	642-651
ORKIN, M., BLACKWELL, D. AND FREEDMAN, D. The optimal reward operator in dynamic programming.....	926-941
PATHAK, P. K., QUALLS, C., KOOPMANS, L. H. AND MARTIN, N. On the divergence of a certain random series.....	546-550
PFANZAGL, J. Convexity and conditional expectations.....	490-494
PURI, PREM S. AND RUBIN, HERMAN. On a characterization of the family of distributions with constant multivariate failure rates.....	738-740
PUTERMAN, MARTIN L. Sensitive discount optimality in controlled one dimensional diffusions.....	408-419
QUALLS, C., KOOPMANS, L. H., MARTIN, N. AND PATHAK, P. K. On the divergence of a certain random series.....	546-550
RAMACHANDRAN, D. Mixtures of perfect probability measures.....	495-500
REISS, R.-D. On the accuracy of the normal approximation for quantiles.....	741-745
RESSEL, PAUL. Weak convergence of certain vectorvalued measures....	136-142
REVUZ, D. AND BRUNEL, A. Un critère probabiliste de compacité des groupes.....	745-746
ROGGE, L. Uniform inequalities for conditional expectations.....	486-489
RUBIN, HERMAN AND PURI, PREM S. On a characterization of the family of distributions with constant multivariate failure rates.....	738-740

SAMUEL-CAHN, ESTER. Asymptotic distributions for occupancy and waiting time problems with positive probability of falling through cells.....	515-521
SCHAY, GEZA. Nearest random variables with given distributions.....	163-166
SEN, PRANAB KUMAR. Weak convergence of generalized $U$ -statistics.....	90-102
SEN, PRANAB KUMAR. Weak convergence of multidimensional empirical processes for stationary $\phi$ -mixing processes.....	147-154
SHEU, SHEY SHIUNG. Some iterated logarithm results for sums of independent two-dimensional random variables.....	1139-1151
SILVERSTEIN, MARTIN L. Symmetric Markov chains .....	681-701
SIMONS, GORDON. Generalized distribution functions: the linearly ordered case with applications to nonparametric statistics .....	501-508
SMYTHE, R. T. Sums of independent random variables on partially ordered sets.....	906-917
SNELL, J. LAURIE AND GRIFFEATH, DAVID. Optimal stopping in the stock market .....	1-13
STECK, G. P. A new formula for $P(R_i \leq b_i, 1 \leq i \leq m   n, n, F = G^k)$ .....	155-160
STEUTEL, F. W. AND KEILSON, JULIAN.....	112-130
TAKÁCS, LAJOS. Sojourn time problems.....	420-431
TEICHER, HENRY. On the law of the iterated logarithm.....	714-728
TWEEDIE, RICHARD L. $R$ -theory for Markov chains on a general state space I: solidarity properties and $R$ -recurrent chains.....	840-864
TWEEDIE, RICHARD L. $R$ -theory for Markov chains on a general state space II: $r$ -subinvariant measures for $r$ -transient chains.....	865-878
VAN SCHUPPEN, JAN AND WONG, EUGENE. Transformation of local martingales under a change of law.....	879-888
VARAIYA, P. AND DAVIS, M. H. A. The multiplicity of an increasing family of $\sigma$ -fields.....	958-963
VILLALOBOS, ALVARO GONZÁLEZ. Some functional limit theorems for dependent random variables.....	1090-1107
WALKER, LEROY H. Optimal stopping variables for Brownian motion	317-320
WALKER, LEROY H. Optimal stopping variables for stochastic processes with independent increments.....	309-316
WARREN, PETER AND BECK, ANATOLE. Strong laws of large numbers for weakly orthogonal sequences of Banach space-valued random variables.....	918-925
WATSON, GEOFFREY AND HARTMAN, PHILIP. "Normal" distribution functions on spheres and the modified Bessel functions .....	593-607
WEISS, N. A., DRISCOLL, M. F. AND McDONALD, J. N. LLN for weakly stationary processes on locally compact Abelian groups.....	1168-1171
WICHURA, MICHAEL J. Functional laws of the iterated logarithm for the partial sums of i. i. d. random variables in the domain of attraction of a completely asymmetric stable law.....	1108-1138
WICHURA, MICHAEL J. On the functional form of the law of the iterated logarithm for the partial maxima of independent identically distributed random variables.....	202-230

- WONG, EUGENE AND VAN SCHUPPEN, JAN. Transformation of local  
martingales under a change of law . . . . . 879-888

### BOOK REVIEWS

- THEODORESCU, RADU. Review of "Markov Processes and Learning  
Models" by M. Frank Norman . . . . . 964-966
- WILLIAMSON, JOHN A. Review of "Branching Processes" by K. B.  
Athreya and P. E. Ney . . . . . 966-968

### NOTES

- MARSAGLIA, GEORGE. Acknowledgment of Priority to "Random vari-  
ables with independent binary digits" . . . . . 747
- ROBERTS, FRED S. Correction to "A note on Fine's axiom for qualita-  
tive probability" . . . . . 182