

THE ANNALS
of
PROBABILITY

AN OFFICIAL JOURNAL OF THE INSTITUTE OF
MATHEMATICAL STATISTICS

VOLUME 10

1982

CONTENTS OF VOLUME 10

Special Invited Papers

BERMAN, SIMEON M. Sojourns and extremes of stationary processes . . .	1–46
WIERMAN, JOHN C. Percolation theory	509–524
WALSH, JOHN B. Propagation of singularities in the Brownian sheet . . .	279–288

Articles and Short Communications

ANDJEL, ENRIQUE DANIEL. Invariant measures for the zero range process	525–547
ASSAF, DAVID N. AND LEVIKSON, BENNY Z. Closure of phase type distributions under operations arising in reliability theory	265–269
BERGER, MARC A. AND MIZEL, VICTOR J. An extension of the stochastic integral	435–450
BERGMAN, BO. On a general asymptotic independence result in statistics	831–837
BICKEL, P. J. AND ROBINSON, J. Edgeworth expansions and smoothness	500–503
BLOCK, HENRY W., SAVITS, THOMAS H. AND SHAKED, MOSHE. Some concepts of negative dependence	765–772
BOLTHAUSEN, E. On the central limit theorem for stationary mixing random fields	1047–1050
BOLTHAUSEN, E. Exact convergence rates in some martingale central limit theorems	672–688
BROCKETT, PATRICK AND KEMPERMAN, J. H. B. On the unimodality of high convolutions	270–278
CABAÑA, E. M. AND WSCEBOR, M. The two-parameter Brownian bridge: Kolmogorov inequalities and upper and lower bounds for the distribution of the maximum	289–302
CACOULOS, THEOPHILOS. On upper and lower bounds for the variance of a function of a random variable	799–809
CHIANG, TZUU-SHUH. A lower bound of the asymptotic behavior of some Markov processes	955–967
COX, DENNIS D. On the existence of natural rate of escape functions for infinite dimensional Brownian motions	623–638
CUZICK, JACK. Continuity of Gaussian local time	818–823
CUZICK, JACK AND DUPREEZ, JOHANNES P. Joint continuity of Gaussian local times	810–817
DAWSON, DONALD A. AND HOCHBERG, KENNETH J. Wandering random measures in the Fleming-Viot model	554–580
DE ACOSTA, ALEJANDRO. Invariance principles in probability for triangular arrays of B-valued random vectors and some applications	346–373

DE HAAN, L. AND RESNICK, S. I. Local limit theorems for sample extremes	396–413
DEHEUVELS, PAUL. Strong limiting bounds for maximal uniform spacings	1058–1065
DEHLING, HEROLD AND PHILIPP, WALTER. Almost sure invariance principles for weakly dependent vector-valued random variables	689–701
DEVROYE, LUC. A log log law for minimal uniform spacings	863–868
DOES, RONALD J. M. M. Berry-Esseen theorem for simple linear rank statistics under the null hypothesis	982–991
DROBOT, VLADIMIR. Probabilistic version of a curvature formula	860–862
DUPREEZ, JOHANNES P. AND CUZICK, JACK. Joint continuity of Gaussian local times	810–817
DURRETT, RICHARD. A new proof of Spitzer's result on the winding of two dimensional Brownian motion	244–246
EDGAR, G. A. Additive amarts	199–206
ELLIS, RICHARD S. AND ROSEN, JAY S. Laplace's method for Gaussian integrals with an application to statistical mechanics	47–66
EMERY, M. A generalization of stochastic integration with respect to semimartingales	709–727
FINSTER, MARK. The maximum term and first passage times for autoregressions	737–744
FINSTER, MARK. Optimal stopping on autoregressive schemes	745–753
FLATTO, L. Limit theorems for some random variables associated with urn models	927–934
GARDNER, R. J. A note on conditional distributions and orthogonal measures	877–878
GLÖTZL, E. AND WAKOLBINGER, A. Bayes estimators and ergodic decomposability with an application to Cox processes	872–876
GRAY, LAWRENCE AND GRIFFEATH, DAVID. A stability criterion for attractive nearest neighbor spin systems on \mathbb{Z}	67–85
GRIFFEATH, DAVID AND GRAY, LAWRENCE. A stability criterion for attractive nearest neighbor spin systems on \mathbb{Z}	67–85
GRIFFEATH, DAVID, AND LIGGETT, THOMAS M. Critical phenomena for Spitzer's reversible nearest particle systems	881–895
GRIFFIN, PHILIP S. Rates of escape of random walks	869–871
HAGWOOD, CHARLES AND WOODROOFE, MICHAEL. On the expansion for expected sample size in nonlinear renewal theory	844–848
HAJEK, BRUCE. Stochastic equations of hyperbolic type and a two-parameter Stratonovich calculus	451–463
HALL, PETER. On the rate of convergence in the weak law of large numbers	374–381
HALL, PETER. Limit theorems for estimators based on inverses of spacings of order statistics	992–1003
HALL, PETER. Bounds on the rate of convergence of moments in the central limit theorem	1004–1018

HILL, T. P. Conditional generalizations of strong laws which conclude the partial sums converge almost surely	828-830
HILL, T. P., AND KERTZ, ROBERT P. Comparison of stop rule and supremum expectations of i.i.d. random variables	336-345
HOCHBERG, KENNETH J. AND DAWSON, DONALD A. Wandering random measures in the Fleming-Viot model	554-580
HOLMES, J. P., HUDSON, WILLIAM N. AND MASON, J. DAVID. Operator-stable laws: multiple exponents and elliptical symmetry	602-612
HOLTE, JOHN M. Critical multitype branching processes	482-495
HUDSON, WILLIAM N., MASON, J. DAVID, AND HOLMES, J. P. Operator-stable laws: multiple exponents and elliptical symmetry	602-612
JUREK, ZBIGNIEW J. Structure of a class of operator-selfdecomposable probability measures	849-856
KARANDIKAR, R. L. Multiplicative decomposition of non-singular matrix valued continuous semimartingales	1088-1091
KASAHARA, YUJI. A limit theorem for slowly increasing occupation times	728-736
KEENER, ROBERT W. Renewal theory for Markov chains on the real line	942-954
KEMPERMAN, J. H. B. AND BROCKETT, PATRICK. On the unimodality of high convolutions	270-278
KENT, JOHN T. The spectral decomposition of a diffusion hitting time	207-219
KERTZ, ROBERT P. AND HILL, T. P. Comparison of stop rule and supremum expectations of i.i.d. random variables	336-345
KLEIN, ABEL, SHUCKER, DAVID S. AND LANDAU, LAWRENCE J. Decoupling inequalities for stationary Gaussian processes	702-708
KÔNO, NORIO. Another version of Strassen's log log law with an application to approximate upper functions of a Gaussian process with a positive index	303-319
KUCZEK, THOMAS. On the convergence of the empiric age distribution for one dimensional supercritical age dependent branching processes	252-258
LAI, TZE LEUNG, AND WEI, CHING ZONG. A law of the iterated logarithm for double arrays of independent random variables with applications to regression and time series models	320-335
LANDAU, LAWRENCE J., SHUCKER, DAVID S. AND KLEIN, ABEL. Decoupling inequalities for stationary Gaussian processes	702-708
LANGBERG, NAFTALI A., AND SHAKED, MOSHE. On the identifiability of multivariate life distribution functions	773-779
LEADBETTER, M. R., ROOTZEN, HOLGER, AND WATTS, VERNON. On limiting distributions of intermediate order statistics from stationary sequences	653-662
LEVIKSON, BENNY Z. AND ASSAF, DAVID N. Closure of phase type distributions under operations arising in reliability theory	265-269
LIGGETT, THOMAS M. AND GRIFFEATH, DAVID. Critical phenomena for Spitzer's reversible nearest particle systems	881-895

MAHARAM, DOROTHY. Orthogonal measures: an example	879
MARSHALL, ALBERT W. AND SHAKED, MOSHE. A class of multivariate new better than used distributions	259-264
MARTINSEK, ADAM T. Moments and error rates of two-sided stopping rules	935-941
MASON, DAVID M. Laws of large numbers for sums of extreme values	754-764
MASON, DAVID M. Some characterizations of strong laws for linear functions of order statistics	1051-1057
MASON, J. DAVID, HOLMES, J. P., AND HUDSON, WILLIAM N. Operator- stable laws: multiple exponents and elliptical symmetry	602-612
MATHAI, A. M. On a conjecture in geometric probability regarding asymptotic normality of a random simplex	247-251
MCLEISH, D. L. AND O'BRIEN, G. L. The expected ratio of the sum of squares to the square of the sum	1019-1028
MICHEL, R. Generalization and application of a result of C. C. Heyde	1066-1068
MIJNHEER, JOOP. Limit points of $\{n^{-1/\alpha}S_n\}$	382-395
MITRA, S. S. Stable Laws of Index 2^{-n}	857-859
MIZEL, VICTOR J. AND BERGER, MARC A. An extension of the stochastic integral	435-450
MÓRICZ, F. A., SERFLING, R. J. AND STOUT, W. F. Moment and probability bounds with quasi-superadditive structure for the max- imum partial sum	1032-1040
MÓRI, F. T. AND SZÉKELY, G. J. Asymptotic behavior of symmetric polynomial statistics	124-131
NANTHI, K. AND VENKATARAMAN, K. N. A limit theorem on a sub- critical Galton-Watson process with immigration	1069-1074
NANTHI, K. AND VENKATARAMAN, K. N. Some limit theorems on a supercritical Galton-Watson process	1075-1078
NAWROTZKI, KURT. Finite Markov chains in stationary random environments	1041-1046
NEUHOFF, DAVID L., AND SHIELDS, PAUL C. Channel entropy and primitive approximation	188-198
NEYMAN, ABRAHAM. Renewal theory for sampling without replacement	464-481
O'BRIEN, G. L. AND MCLEISH, D. L. The expected ratio of the sum of squares to the square of the sum	1019-1028
PELIGRAD, MAGDA. Invariance principles for mixing sequences of random variables	968-981
PHILLIPP, WALTER AND DEHLING, HEROLD. Almost sure invariance principles for weakly dependent vector-valued random variables	689-701
PITT, LOREN D. Positively correlated normal variables are associated	496-499
POLLARD, DAVID. A central limit theorem for k-means clustering	919-926
POOR, H. VINCENT. Minimax linear smoothing for capacities	504-508
PRINZ, P. Martingales with given convex image	1085-1087

QUINE, M. P. AND ROBINSON, J. A Berry-Esseen bound for an occupancy problem	663-671
REICH, JAKOB I. Some results on distributions arising from coin tossing	780-786
REICH, JAKOB I. When do weighted sums of independent random variables have a density—some results and examples	787-798
RESNICK, S. I. AND DE HAAN, L. Local limit theorems for sample extremes	396-413
RÉVÉSZ, P. On the increments of Weiner and related processes	613-622
RICE, S. O. The integral of the absolute value of the pinned Wiener process—calculation of its probability density by numerical integration	240-243
ROBINSON, J. AND BICKEL, P. J. Edgeworth expansions and smoothness	500-503
ROBINSON, J. AND QUINE, M. P. A Berry-Esseen bound for an occupancy problem	663-671
ROOTZÉN, HOLGER, WATTS, VERNON AND LEADBETTER, M. R. On limiting distributions of intermediate order statistics from stationary sequences	653-662
ROSEN, JAY S. AND ELLIS, RICHARD S. Laplace's method for Gaussian integrals with an application to statistical mechanics	47-66
RUPPERT, DAVID. Almost sure approximations to the Robbins-Monro and Kiefer-Wolfowitz processes with dependent noise	178-187
RUZSA, I. Z. AND SZÉKELY, G. J. Intersections of traces of random walks with fixed sets	132-136
SAVITS, THOMAS H., SHAKED, MOSHE AND BLOCK, HENRY W. Some concepts of negative dependence	765-772
SEN, PRANAB KUMAR. A renewal theorem for an urn model	838-843
SERFLING, R. J., STOUT, W. F., AND MÓRICZ, F. A. Moment and probability bounds with quasi-superadditive structure for the maximum partial sum	1032-1040
SERFOZO, RICHARD. Functional light theorems for extreme values of arrays of independent random variables	172-177
SHAKED, MOSHE, BLOCK, HENRY H. AND SAVITS, THOMAS H. Some concepts of negative dependence	765-772
SHAKED, MOSHE, AND LANGBERG, NAFTALI A. On the identifiability of multivariate life distribution functions	773-779
SHAKED, MOSHE AND MARSHALL, ALBERT W. A class of multivariate new better than used distributions.	259-264
SHEPP, L. A. On the integral of the absolute value of the pinned Wiener process	234-239
SHEPP, L. A. The XYZ conjecture and the FKG inequality	824-827
SHIELDS, PAUL C. AND NEUHOFF, DAVID L. Channel entropy and primitive approximation	188-198
SMITH, RICHARD L. The asymptotic distribution of the strength of a series-parallel system with equal load-sharing	137-171

SHORACK, GALEN R. AND WELLNER, JON A. Limit theorems and inequalities for the uniform empirical process indexed by intervals	639–652
SHUCKER, DAVID S., KLEIN, ABEL AND LANDAU, LAWRENCE J. Decoupling inequalities for stationary Gaussian processes	702–708
SIEGMUND, D. Large deviations for boundary crossing probabilities	581–588
STEELE, J. MICHAEL. Optimal triangulations of random samples in the plane	548–553
STOUT, W. F., MÓRICZ, F. A., AND SERFLING, R. J. Moment and probability bounds with quasi-superadditive structure for the maximum partial sum	1032–1040
STUTE, WINFRIED. A law of the logarithm for kernel density estimators	414–422
STUTE, WINFRIED. The oscillation behavior of empirical processes	86–107
SZÉKELY, G. J. AND MÓRI, F. T. Asymptotic behaviour of symmetric polynomial statistics	124–131
SZÉKELY, G. J. AND RUZSA, I. Z. Intersections of traces of random walks with fixed sets	132–136
TAKSAR, M. I. First hitting time of curvilinear boundary by Wiener process	1029–1031
UCHIYAMA, KŌHEI. The proportion of Brownian sojourn outside a moving boundary	220–233
UCHIYAMA, KŌHEI. Spatial growth of a branching process of particles living in \mathbb{R}^d	896–918
VANDEMAELE, M. AND VERAVERBEKE, N. Cramér type large deviations and moderate deviations for linear combinations of order statistics	423–434
VAN ZUIJLEN, MARTIEN C. A. Properties of the empirical distribution function for independent non-identically distributed random vectors	108–123
VENKATARAMAN, K. N. AND NANTHI, K. A limit theorem on a subcritical Galton-Watson process with immigration	1069–1074
VENKATARAMAN, K. N. AND NANTHI, K. Some limit theorems on a supercritical Galton-Watson process	1075–1078
VERAVERBEKE, N. AND VANDEMAELE, M. Cramér type large deviations and moderate deviations for linear combinations of order statistics	423–434
WAKOLBINGER, A. AND GLÖTZL, E. Bayes estimators and ergodic decomposability with an application to Cox processes	872–876
WATTS, VERNON, LEADBETTER, M. R. AND ROOTZÉN, HOLGER. On limiting distributions of intermediate order statistics from stationary sequences	653–662
WEI, CHING ZONG AND LAI, TZE LEUNG. A law of the iterated logarithm for double arrays of independent random variables with applications to regression and time series models	320–335

WELLNER, JON A. AND SHORACK, GALEN R. Limit theorems and inequalities for the uniform empirical process indexed by intervals	639–652
WOODROOFE, MICHAEL AND HAGWOOD, CHARLES. On the expansion for expected sample size in nonlinear renewal theory	844–848
WSCHEBOR, M. AND CABAÑA, E. M. The two-parameter Brownian bridge: Kolmogorov inequalities and upper and lower bounds for the distribution of the maximum	289–302
WU, RONG. Some limit theorems on reversed Brownian motion	1079–1084
YAMAZATO, MAKOTO. On strongly unimodal infinitely divisible distributions	589–601

Corrections and Notes

LANDERS, D. AND ROGGE, L. Natural medians	1092
ROGGE, L. AND LANDERS, D. Natural medians	1092