

THE ANNALS of STATISTICS

ISSN (0090-5364)

AN OFFICIAL JOURNAL OF THE
INSTITUTE OF MATHEMATICAL STATISTICS

Articles

Maximum likelihood type estimation for nearly nonstationary autoregressive time series	DENNIS D. COX AND ISABEL LLATAS	1109
Gaussian likelihood estimation for nearly nonstationary AR(1) processes . .	DENNIS D. COX	1129
Estimation of the parameters of linear time series models subject to nonlinear restrictions	NEERCHAL K. NAGARAJ AND WAYNE A. FULLER	1143
Convergence of moments of least squares estimators for the coefficients of an autoregressive process of unknown order . .	R. J. BHANSALI AND F. PAPANGELOU	1155
The variational form of certain Bayes estimators	L. R. HAFF	1163
Bayes empirical Bayes estimation for natural exponential families with quadratic variance functions	G. G. WALTER AND G. G. HAMEDANI	1191
Diameter and volume minimizing confidence sets in Bayes and classical problems	ANIRBAN DASGUPTA	1225
Robust Bayesian experimental designs in normal linear models	A. DASGUPTA AND W. J. STUDDEN	1244
On the optimal rates of convergence for nonparametric deconvolution problems	JIANQING FAN	1257
On the estimation of quadratic functionals	JIANQING FAN	1273
Edgeworth expansion of a function of sample means	Z. D. BAI AND C. RADHAKRISHNA RAO	1295
Efficient estimation of linear functionals of a probability measure P with known marginal distributions	PETER J. BICKEL, YA'ACOV RITOV AND JON A. WELLNER	1316
Approximation of density functions by sequences of exponential families	ANDREW R. BARRON AND CHYONG-HWA SHEU	1347
Large sample theory of a modified Buckley–James estimator for regression analysis with censored data	TZE LEUNG LAI AND ZHILIANG YING	1370
Weak convergence of time-sequential censored rank statistics with applications to sequential testing in clinical trials	MING GAO GU AND TZE LEUNG LAI	1403
Conditional rank tests for randomly censored data	ARNOLD JANSSEN	1434
Almost sure asymptotic representation for a class of functionals of the Kaplan–Meier estimator	IRÈNE GJEBELS AND NOËL VERVERBEKE	1457
The asymptotic behavior of some nonparametric change-point estimators	L. DÜMBGEN	1471
Some bootstrap tests of symmetry for univariate continuous distributions	MIGUEL A. ARCONES AND EVARIST GINÉ	1496
Spline functions and stochastic filtering	CHRISTINE THOMAS-AGNAN	1512
Some stabilized bandwidth selectors for nonparametric regression . .	SHEAN-TSONG CHIU	1528
On tail index estimation using dependent data	TAILEN HSING	1547
A geometric approach to detecting influential cases	PAUL W. VOS	1570
Trend-free block designs for varietal and factorial experiments	MEILI LIN AND A. M. DEAN	1582
On the balanced incomplete block design for rankings	M. ALVO AND P. CABILLO	1597
Optimal weights for experimental designs on linearly independent support points	FRIEDRICH PUKELSHEIM AND BEN TORSNEY	1614
Inference for the crossing point of two continuous cdf's	D. L. HAWKINS AND SUBHASH C. KOCHAR	1626
Generalizations of James–Stein estimators under spherical symmetry	ANN COHEN BRANDWEIN AND WILLIAM E. STRAWDERMAN	1639
An E -ancillarity projection property of Cox's partial score function	I-SHOU CHANG AND CHAO A. HSIUNG	1651

Short Communications

The singularities of fitting planes to data	STEVEN P. ELLIS	1661
Optimality of some two-associate-class partially balanced incomplete-block designs	C.-S. CHENG AND R. A. BAILEY	1667
Monotone gain, first-order autocorrelation and zero-crossing rate	BENJAMIN KEDEM AND TA-HSIN LI	1672
On the monotonicity of a certain expectation	RASUL A. KHAN	1677

Vol. 19, No. 3—September 1991

INSTITUTE OF MATHEMATICAL STATISTICS

(Organized September 12, 1935)

The purpose of the Institute is to foster the development and dissemination of the theory and applications of statistics and probability.

OFFICERS AND EDITORS

- President:** Willem R. van Zwet, Department of Mathematics, University of Leiden, P.O. Box 9512, 2300 RA Leiden, The Netherlands
- President-Elect:** Lawrence D. Brown, Department of Mathematics, White Hall, Cornell University, Ithaca, New York 14853-7901
- Past President:** David O. Siegmund, Department of Statistics, Sequoia Hall, Stanford University, Stanford, California 94305
- Executive Secretary:** Diane M. Lambert, AT&T Bell Laboratories, 600 Mountain Avenue, Room 2C-256, Murray Hill, New Jersey 07974
- Treasurer:** Jessica Utts, Division of Statistics, University of California, Davis. *Please send correspondence to: IMS Business Office, 3401 Investment Boulevard #7, Hayward, California 94545*
- Program Secretary:** Robert E. Kass, Department of Statistics, Carnegie Mellon University, Pittsburgh, Pennsylvania 15213
- Editor, *The Annals of Statistics*:** Arthur Cohen, Department of Statistics, Busch Campus, Rutgers University, New Brunswick, New Jersey 08903
- Editor, *The Annals of Probability*:** Burgess Davis, Departments of Mathematics and Statistics, Purdue University, West Lafayette, Indiana 47907
- Editor, *The Annals of Applied Probability*:** J. Michael Steele, Department of Statistics, University of Pennsylvania, Philadelphia, Pennsylvania 19104-6302
- Executive Editor, *Statistical Science*:** Carl N. Morris, Department of Statistics, Science Center, Harvard University, One Oxford Street, Cambridge, Massachusetts 02138
- Editor, *The IMS Bulletin*:** George P. H. Styan, Department of Mathematics and Statistics, Burnside Hall, McGill University, 805 Sherbrooke Street West, Montreal PQ, Canada H3A 2K6
- Editor, *The IMS Lecture Notes—Monograph Series*:** Robert J. Serfling, Department of Mathematical Sciences, Johns Hopkins University, Baltimore, Maryland 21218
- Managing Editor:** Roger L. Berger, Department of Statistics, Box 8203, North Carolina State University, Raleigh, North Carolina 27695
- Managing Editor:** Robert Smythe, Department of Statistics, George Washington University, 2201 G Street N.W., Washington, D.C. 20052

Journals. The scientific journals of the Institute are *The Annals of Statistics*, *The Annals of Probability*, *The Annals of Applied Probability* and *Statistical Science*. The news organ of the Institute is *The Institute of Mathematical Statistics Bulletin*.

Individual and Organizational Memberships. All individual members receive *The IMS Bulletin* for basic membership dues of \$40. Each regular member must elect to receive at least one scientific journal for an additional amount, as follows: *Statistical Science* (\$10), *The Annals of Statistics* or *The Annals of Probability* (\$20), *The Annals of Statistics* and *The Annals of Probability* (\$30), or *The Annals of Applied Probability* (\$10). Of the total dues paid, \$24 is allocated to *The IMS Bulletin* and the remaining amount is allocated equally among the scientific journal(s) received. Reduced membership dues are available to full-time students, permanent residents of countries designated by the IMS Council and retired members. Retired members may elect to receive the *Bulletin* only for \$16. *Organizational memberships* are available to nonprofit organizations at \$350 per year and to for-profit organizations at \$650 per year. Organizational memberships include two multiple-readership copies of all IMS journals in addition to other benefits specified for each category (details available from the IMS Business Office).

Individual and General Subscriptions. Subscriptions are available on a calendar-year basis. *Individual subscriptions* are for the personal use of the subscriber and must be in the name of, paid directly by, and mailed to an individual. Individual subscriptions for 1991 are available to *The Annals of Statistics* and *The Annals of Probability* (\$90), *The Annals of Statistics* or *The Annals of Probability* (\$60), *Statistical Science* (\$50), *The Annals of Applied Probability* (\$50), and *The IMS Bulletin* (\$30). *General subscriptions* are for libraries, institutions and any multiple-readership use. General subscriptions for 1991 are available to *The Annals of Statistics* (\$110), *The Annals of Probability* and *The Annals of Applied Probability* (\$150), *Statistical Science* (\$60), *The Annals of Applied Probability* only (\$60), and *The IMS Bulletin* (\$40). Multiple-item subscriptions are discounted by 10% for two items and 15% for three or more items. Air mail rates for delivery outside of North America are \$65 per title.

Permissions policy. Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by the Institute of Mathematical Statistics, provided that the base fee of \$5.00 per copy, plus \$.00 per page is paid directly to the Copyright Clearance Center, 27 Congress Street, Salem, Massachusetts 01970. For those organizations that have been granted a photocopy license by CCC, a separate system of payment has been arranged. The fee code for users of the Transactional Reporting Service is: 0091-1798/91 \$5.00 + .00.

Correspondence. Mail to IMS should be sent to the IMS Business Office (membership, subscriptions, claims, copyright permissions, advertising, back issues), the Editor of the appropriate journal (submissions, editorial content) or the Production Editor, Patrick Kelly, Department of Statistics, University of Pennsylvania, Philadelphia, Pennsylvania 19104-6302.

***The Annals of Statistics* (ISSN 0090-5364)**, Volume 19, Number 3, September, 1991. Published quarterly by the Institute of Mathematical Statistics, 3401 Investment Boulevard #7, Hayward, California 94545. Second-class postage paid at Hayward, California and at additional mailing offices. **POSTMASTER:** Send address changes to *The Annals of Statistics*, Institute of Mathematical Statistics, 3401 Investment Boulevard #7, Hayward, California 94545.

EDITORIAL STAFF

EDITOR

ARTHUR COHEN

ASSOCIATE EDITORS

JAMES O. BERGER
ROBERT H. BERK
PETER J. BICKEL
LAWRENCE D. BROWN
ANDREAS BUJA
CHING-SHUI CHENG
LINDA J. DAVIS
MORRIS L. EATON
DAVID F. FINDLEY
RICHARD D. GILL

FRIEDRICH GÖTZE
PETER HALL
LAIN M. JOHNSTONE
ESTATE V. KHMALADZE
HANS R. KÜNSCH
STEVEN LALLEY
KER-CHAU LI
BRUCE G. LINDSAY
WEI-YIN LOH
J. S. MARRON

IAN W. MCKEAGUE
ROBB J. MUIRHEAD
DAVID RUPPERT
MARK SCHERVISH
DAVID W. SCOTT
DAVID O. SIEGMUND
TERRY SPEED
CHING-ZONG WEI
MICHAEL WOODROOFE
JAMES V. ZIDEK

EDITORIAL ASSISTANT

APRIL ALLRIDGE

MANAGING EDITOR

ROGER L. BERGER

PRODUCTION EDITOR

PATRICK KELLY

EDITORIAL ASSISTANT

ANN P. ROUSE

PAST EDITORS

THE ANNALS OF MATHEMATICAL STATISTICS

H. C. CARVER, 1930–1938
S. S. WILKS, 1938–1949
T. W. ANDERSON, 1950–1952
E. L. LEHMANN, 1953–1955
T. E. HARRIS, 1955–1958

WILLIAM KRUSKAL, 1958–1961
J. L. HODGES, JR., 1961–1964
D. L. BURKHOLDER, 1964–1967
Z. W. BIRNBAUM, 1967–1970
INGRAM OLKIN, 1970–1972

THE ANNALS OF STATISTICS

INGRAM OLKIN, 1972–1973
I. R. SAVAGE, 1974–1976
RUPERT G. MILLER, JR., 1977–1979
DAVID V. HINKLEY, 1980–1982
MICHAEL D. PERLMAN, 1983–1985
WILLEM R. VAN ZWET, 1986–1988

THE ANNALS OF PROBABILITY

RONALD PYKE, 1972–1975
PATRICK BILLINGSLEY, 1976–1978
R. M. DUDLEY, 1979–1981
HARRY KESTEN, 1982–1984
THOMAS M. LIGGETT, 1985–1987
PETER NEY, 1988–1990

EDITORIAL POLICY

The main purpose of *The Annals of Statistics*, *The Annals of Probability* and *The Annals of Applied Probability* is to publish significant contributions to the theory of statistics and probability and their applications. The emphasis is on importance and interest; formal novelty and mathematical correctness alone are not sufficient for publication. Especially appropriate are authoritative expository papers and surveys of areas in vigorous development. Because statistics is an evolving discipline, the Editors of *The Annals of Statistics* take a broad view of its domain and welcome papers in interface areas. Contributors to *The Annals of Statistics* should review the editorial in the January 1980 issue. All papers are refereed.

ADDITIONAL GUIDELINES FOR PREPARING PAPERS FOR THE ANNALS OF STATISTICS

1. The introduction and/or abstract should contain a statement pertaining to the statistical importance of the paper. Sometimes this is clear when reference is made to previous work. Statistical importance, not mathematical complexity for its own sake, is the prime criterion for publication.
2. The introduction should be thorough and contain clear yet nontechnical descriptions of the important results. Furthermore, the introduction should give a clear indication of where in the paper the main results and conclusions are to be found.
3. In papers where the formulation is general and mathematically abstract, when appropriate, the author should provide a short development of a special case, an example, or an illustration of the results. If possible, the special case or example should be in the introduction or shortly thereafter.
4. The manuscript should be proofread thoroughly before being submitted. Manuscripts with many typographical errors will cause unnecessary delays and may require resubmission.

IMS CORPORATE MEMBERS

THE AEROSPACE CORPORATION
Los Angeles, California

AT & T BELL LABORATORIES
Murray Hill, New Jersey

BELL COMMUNICATIONS RESEARCH
Morristown, New Jersey

GENERAL MOTORS CORPORATION
Research Laboratories
Warren, Michigan

INTERNATIONAL BUSINESS MACHINES CORP
Thomas J. Watson Research Center
Yorktown Heights, New York

SPRINGER-VERLAG NEW YORK INCORPORATED
New York, New York

IMS INSTITUTIONAL MEMBERS

ACADEMIA SINICA
Inst of Statistical Science
Taipei, Taiwan

AMERICAN UNIVERSITY
Dept of Mathematics and Statistics
Washington, DC

ARIZONA STATE UNIVERSITY
Committee on Statistics
Dept of Mathematics and Decision
and Information Systems
Tempe, Arizona

AUSTRALIAN NATIONAL UNIVERSITY
Canberra, ACT, Australia

BOWLING GREEN STATE UNIVERSITY
Dept of Mathematics and Statistics
Bowling Green, Ohio

CALIFORNIA STATE UNIVERSITY
AT FULLERTON
Dept of Mathematics
Fullerton, California

CASE WESTERN RESERVE UNIVERSITY
Dept of Mathematics and Statistics
Cleveland, Ohio

CENTRE INTERNATIONAL DE
RECONTRE MATH
Marseille, France

CORNELL UNIVERSITY
Dept of Mathematics
Ithaca, New York

DALHOUSIE UNIVERSITY
Killam Memorial Library
Halifax, Nova Scotia, Canada

FLORIDA STATE UNIVERSITY
Dept of Statistics
Tallahassee, Florida

GEORGE WASHINGTON UNIVERSITY
Dept of Statistics
Washington, DC

HARVARD UNIVERSITY
Dept of Biostatistics
Boston, Massachusetts

HARVARD UNIVERSITY
Dept of Statistics
Cambridge, Massachusetts

INDIANA UNIVERSITY
Dept of Mathematics
Bloomington, Indiana

INSTITUTO MEXICANO
DEL PETROLEO
Mexico, DF, Mexico

IOWA STATE UNIVERSITY
Dept of Stat and Statistical Lab
Ames, Iowa

JOHNS HOPKINS UNIVERSITY
Depts of Biostatistics
and Mathematical Sciences
Baltimore, Maryland

KANSAS STATE UNIVERSITY
Dept of Statistics
Manhattan, Kansas

MARA INSTITUTE OF TECHNOLOGY
Selangor, Malaysia

MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Dept of Mathematics
Cambridge, Massachusetts

MIAMI UNIVERSITY LIBRARY
Oxford, Ohio

MICHIGAN STATE UNIVERSITY
Dept of Statistics and Probability
East Lansing, Michigan

NATIONAL SECURITY AGENCY
Fort George G. Meade, Maryland

NEW MEXICO STATE UNIVERSITY
Dept of Mathematical Sciences
Las Cruces, New Mexico

NORTH CAROLINA STATE UNIVERSITY
Dept of Statistics
Raleigh, North Carolina

NORTH DAKOTA STATE UNIVERSITY LIBRARY
Fargo, North Dakota

NORTHERN ILLINOIS UNIVERSITY
Dept of Mathematical Sciences
DeKalb, Illinois

OHIO STATE UNIVERSITY
Dept of Statistics
Columbus, Ohio

OREGON STATE UNIVERSITY
Dept of Statistics
Corvallis, Oregon

PENNSYLVANIA STATE UNIVERSITY
Dept of Statistics
University Park, Pennsylvania

PRINCETON UNIVERSITY LIBRARY
Princeton, New Jersey

PURDUE UNIVERSITY LIBRARY
West Lafayette, Indiana

QUEEN'S UNIVERSITY
Dept of Mathematics and Statistics
Kingston, Ontario, Canada

RICE UNIVERSITY LIBRARY
Houston, Texas

THE ROCKEFELLEP UNIVERSITY LIBRARY
New York, New York

SIMON FRASER UNIVERSITY
Dept of Mathematics and Statistics
Burnaby, British Columbia, Canada

SOUTHERN ILLINOIS UNIVERSITY
Dept of Mathematics and Statistics
Edwardsville, Illinois

SOUTHERN METHODIST UNIVERSITY
Dept of Statistics
Dallas, Texas

STANFORD UNIVERSITY
Dept of Statistics
Stanford, California

SYRACUSE UNIVERSITY
Dept of Mathematics
Syracuse, New York

TEMPLE UNIVERSITY
Dept of Mathematics
Philadelphia, Pennsylvania

TEXAS TECH UNIVERSITY
Dept of Mathematics
Lubbock, Texas

UNIVERSITY OF ALBERTA
Dept of Statistics
and Applied Probability
Edmonton, Alberta, Canada

UNIVERSITY OF ARIZONA
Dept of Mathematics
Tucson, Arizona

UNIVERSITY OF BRITISH COLUMBIA
Dept of Statistics
Vancouver, British Columbia, Canada

UNIVERSITY OF CALGARY
Dept of Mathematics and Statistics
Calgary, Alberta, Canada

UNIVERSITY OF CALIFORNIA
Dept of Statistics
Berkeley, California

UNIVERSITY OF CALIFORNIA
Div of Statistics
Davis, California

UNIVERSITY OF CONNECTICUT
Dept of Statistics
Storrs, Connecticut

UNIVERSITY OF FLORIDA
Dept of Statistics
Gainesville, Florida

UNIVERSITY OF GEORGIA
Dept of Statistics
Athens, Georgia

UNIVERSITY OF ILLINOIS
Dept of Statistics
Champaign, Illinois

UNIVERSITY OF ILLINOIS AT CHICAGO
Dept of Math, Stat and Comp Sci
Chicago, Illinois

UNIVERSITY OF IOWA
Dept of Statistics and Actuarial Sci
Iowa City, Iowa

UNIVERSITY OF MARYLAND
Dept of Mathematics
College Park, Maryland

UNIVERSITY OF MASSACHUSETTS
Dept of Mathematics and Statistics
Amherst, Massachusetts

UNIVERSITY OF MICHIGAN
Dept of Statistics
Ann Arbor, Michigan

UNIVERSITY OF MINNESOTA
School of Statistics
Minneapolis, Minnesota

UNIVERSITY OF MISSOURI
Ellis Library
Columbia, Missouri

UNIVERSITY OF MONTREAL
Dept of Mathematics
Montreal, Quebec, Canada

UNIVERSITY OF NEBRASKA
Dept of Mathematics and Statistics
Lincoln, Nebraska

UNIVERSITY OF NEW BRUNSWICK LIBRARY
Fredericton, New Brunswick, Canada

UNIVERSITY OF NEW MEXICO
Dept of Mathematics and Statistics
Albuquerque, New Mexico

UNIVERSITY OF NORTH CAROLINA
Dept of Statistics
Chapel Hill, North Carolina

UNIVERSITY OF OREGON
Dept of Mathematics
Eugene, Oregon

UNIVERSITY OF OTTAWA
Dept of Mathematics
Ottawa, Ontario, Canada

UNIVERSITY OF PENNSYLVANIA
Dept of Statistics
Philadelphia, Pennsylvania

UNIVERSITY OF SOUTH CAROLINA
Dept of Statistics
Columbia, South Carolina

UNIVERSITY OF STOCKHOLM
Inst of Actuarial Math and Math Stat
Stockholm, Sweden

UNIVERSITY OF TEXAS AT AUSTIN
Dept of Mathematics
Austin, Texas

UNIVERSITY OF TEXAS AT SAN ANTONIO
Div of Math, Comp Sci and Systems Design
San Antonio, Texas

UNIVERSITY OF VICTORIA
Dept of Mathematics
Victoria, British Columbia, Canada

UNIVERSITY OF VIRGINIA
Dept of Mathematics
Charlottesville, Virginia

UNIVERSITY OF WASHINGTON
Dept of Statistics
Seattle, Washington

UNIVERSITY OF WATERLOO
Dept of Statistics and Actuarial Sci
Waterloo, Ontario, Canada

VIRGINIA COMMONWEALTH UNIVERSITY
Dept of Mathematical Sciences
Richmond, Virginia

VIRGINIA POLYTECHNIC INSTITUTE
AND STATE UNIVERSITY
Dept of Statistics
Blacksburg, Virginia

WAYNE STATE UNIVERSITY
Dept of Mathematics
Detroit, Michigan

YORK UNIVERSITY
Dept of Mathematics
Downsview, Ontario, Canada

THE ANNALS OF STATISTICS

INSTRUCTIONS FOR AUTHORS

Submission of Papers. Papers to be submitted for publication should be sent to the Editor of *The Annals of Statistics*. (For current address, see the latest issue of the *Annals*.) **Four copies** should be submitted on paper that will take ink corrections. The manuscript will *not* normally be returned to the author; when expressly requested by the author, one copy of the manuscript will be returned. All manuscripts should be accompanied by a cover letter.

Preparation of Manuscripts. Manuscripts should be typewritten, entirely double-spaced, including references, with wide margins at sides, top and bottom. All copies must be completely legible. When technical reports are submitted, all extraneous sheets and covers must be removed. Typists should check an issue of the *Annals* for style.

Submission of Reference Papers. Four copies of unpublished or not easily available papers cited in the manuscript should be submitted with the manuscript.

Title. The title should be descriptive and as concise as is feasible, i.e., it should indicate the topic of the paper as clearly as possible, but every word in it should be pertinent.

Abbreviated Title. An abbreviated title to be used as a running head is also **required**. This should normally not exceed 35 characters. For example, an article with the title "The Curvature of a Statistical Model, with Applications to Large-Sample Likelihood Methods," could have the running head, "Curvature of Statistical Model" or possibly "Asymptotics of Likelihood Methods," depending on the emphasis to be conveyed.

Affiliation. Indicate your present institutional affiliation as you would like it to appear.

Summary. Each manuscript is required to contain a summary, clearly separated from the rest of the paper, which will be printed immediately after the title. Its main purpose is to inform the reader quickly of the nature and results of the paper; it may also be used as an aid in retrieving information. The length of a summary will clearly depend on the length and difficulty of the paper, but in general it should not exceed 150 words. Formulas should be used as sparingly as possible within the summary. The summary should not make reference to results or formulas in the body of the paper—it should be self-contained.

Footnotes. Footnotes should not be used, except as described under Title Page Footnotes below. Such information should be included within the text.

Title Page Footnotes. Included as a footnote on page 1 should be the headings:

American Mathematical Society 1980 subject classifications. Primary—; secondary—.

Key words and phrases.

The classification numbers representing the primary and secondary subjects of the article may be

found with instructions for its use in the *Mathematical Reviews Annual Subject Index-1980*. The key words and phrases should describe the subject matter of the article; generally they should be taken from the body of the paper.

Acknowledgment of support. Grants and contracts should also be included in this footnote.

Identification of Symbols. Manuscripts for publication should be clearly prepared to insure that all symbols are properly identified. Distinguish between "oh" and "zero"; "ell" and "one"; "epsilon" and "element of"; "summation" and "capital sigma," etc. Indicate also when special type is required (Greek, German, script, boldface, etc.); unless indicated otherwise, formula letters will be set in italics. Acronyms should be introduced sparingly. Any handwritten symbols should be clearly identified.

Figures and Tables. Figures, charts, and diagrams should be prepared in a form suitable for photographic reproduction and should be professionally drawn twice the size they are to be printed. (These need not be submitted until the paper has been accepted for publication.) The printer does not improve upon the quality of the figures submitted. Tables should be typed on separate pages with accompanying footnotes immediately below the table.

Formulas. Fractions *in the text* are preferably written with the solidus or negative exponent; thus,

$(a + b)/(c + d)$ is preferred to $\frac{a + b}{c + d}$, and $(2\pi)^{-1}$

or $1/(2\pi)$ to $\frac{1}{2\pi}$. Also, $a^{b(c)}$ and $a_{b(c)}$ are preferred

to a^{bc} and a_{bc} , respectively. Complicated exponentials should be represented with the symbol exp. A fractional exponent is preferable to a radical sign.

References. References should be typed double-spaced and should follow the style:

Keifer, J. C. (1976). Admissibility of conditional confidence procedures. *Ann. Statist.* 4 836–865.

In textual material, the format "... Keifer (1976)..." should be used. Multiple references can be distinguished as "... Keifer (1976a)..." Abbreviations for journals should be taken from a current index issue of *Mathematical Reviews*.

Addresses. The permanent address of each author should be typed following the references.

Galley Proofs. The author will ordinarily receive galley proofs. Corrected galley proofs should be sent to AOS Redactory, Science Typographers, Inc., 15 Industrial Boulevard, Medford, NY 11763.

Correspondence. All correspondence with the Editor must refer to the manuscript number of the paper. This number will be on the card sent to the author acknowledging receipt of the article.