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The *Quarterly of Applied Mathematics* prints original papers in applied mathematics which have an intimate connection with applications. It is expected that each paper will be of a high scientific standard; that the presentation will be of such character that the paper can be easily read by those to whom it would be of interest; and that the mathematical argument, judged by the standard of the field of application, will be of an advanced character.

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SUGGESTIONS CONCERNING THE PREPARATION OF MANUSCRIPTS FOR THE QUARTERLY OF APPLIED MATHEMATICS

The editors will appreciate the authors' cooperation in taking note of the following directions for the preparation of manuscripts. These directions have been drawn up with a view toward eliminating unnecessary correspondence, avoiding the return of papers for changes, and reducing the charges made for "author's corrections."

Manuscripts: Manuscripts should be typewritten double-spaced on one side only. Marginal instructions to the typesetter should be written in pencil to distinguish them clearly from the body of the text. The author should keep a complete copy.

The papers should be submitted in final form. Only typographical errors should be corrected in proof; composition charges for any major deviations from the manuscript will be passed on to the author.

Titles: The title should be brief but express adequately the subject of the paper. The name and initials of the author should be written as he/she prefers; all titles and degrees or honors will be omitted. The name of the organization with which the author is associated should be given in a separate line following his/her name.

Mathematical Work: As far as possible, formulas should be typewritten; Greek letters and other symbols not available on the average typewriter should be inserted using either instant lettering or by careful insertion in ink. Manuscripts containing pencilled material other than marginal instructions to the typesetter will not be accepted.

The difference between capital and lower-case letters should be clearly shown; care should be taken to avoid confusion between zero (0) and the letter O, between the numeral one (1), the letter l and the prime ($'$), between alpha and a, kappa and k, mu and u, nu and v, eta and n.

The level of subscripts, exponents, subscripts to subscripts, and exponents to exponents should be clearly indicated.

Single embellishments over individual letters are allowed; the only embellishment allowed above groups of letters is the overbar.

Double embellishments are not allowed. These may be replaced by superscripts following the symbols.

Complicated exponents and subscripts should be avoided. Any complicated expression that recurs frequently should be represented by a special symbol.

For exponentials with lengthy or complicated exponents the symbol exp should be used, particularly if such exponentials appear in the body of the text. Thus,

$$\exp[(a^2 + b^2)^{1/2}] \text{ is preferable to } e^{[a^2+b^2]^{1/2}}.$$

Fractions in the body of the text and fractions occurring in the numerators or denominators of fractions should be written with the solidus. Thus,

$$\frac{\cos(x/2b)}{\cos(a/2b)} \text{ is preferable to } \frac{\cos\frac{x}{2b}}{\cos\frac{a}{2b}}.$$

In many instances the use of negative exponents permits saving of space. Thus,

$$\int u^{-1} \sin u \, du \text{ is preferable to } \int \frac{\sin u}{u} \, du.$$

Whereas the intended grouping of symbols in handwritten formulas can be made clear by slight variations in spacing, this procedure is not acceptable in typeset formulas. To avoid misunderstanding, the order of symbols should therefore be carefully considered. Thus,

$$(a + bx)\cos t \text{ is preferable to } \cos t(a + bx).$$

Figures: Figures should be drawn in black ink with clean, unbroken lines; do not use ball point pen. The paper should be of a nonabsorbant quality so that the ink does not spread and produce fuzzy lines. If the figures are intended for reduction, they should be drawn with heavy enough lines so that they do not become flimsy at the desired reduction. The notation should be of professional quality and in proportion for the expected reduction size. Figures that are unsuitable for reproduction will be returned to the author for redrawing. Legends accompanying figures should be written on a separate sheet.

Bibliography: References should be grouped together in a Bibliography at the end of the manuscript. References in text to the Bibliography should be made by numerals between square brackets.

The following examples show the desired arrangements: (*for books*—S. Timoshenko, *Strength of Materials*, vol. 2, Macmillan and Co., London, 1931, p. 237; *for periodicals*—Lord Rayleigh, *On the flow of viscous liquids, especially in three dimensions*, Phil. Mag. (5) 36, 354–372 (1893)). Note that the number of the series is not separated by commas from the name of the periodical or the number of the volume.

Authors' initials should precede their names rather than follow them.

In quoted titles of books or papers, capital letters should be used only where the language requires this. Thus, *On the flow of viscous fluids* is preferable to *On the Flow of Viscous Fluids*, but the corresponding German title would have to be rendered as *Über die Strömung zäher Flüssigkeiten*.

Titles of books or papers should be quoted in the original language (with an English translation added in parentheses, if this seems desirable), but only English abbreviations should be used for bibliographical details such as ed., vol., no., chap., p.

Footnotes: As far as possible, footnotes should be avoided. Footnotes containing mathematical formulas are not acceptable.

Abbreviations: Much space can be saved by the use of standard abbreviations such as Eq., Eqs., Fig., Sec., Art., etc. These should be used, however, only if they are followed by a reference number. Thus, "Eq. (25)" is acceptable but not "the preceding Eq." Moreover, if any one of these terms occurs as the first word of a sentence, it should be spelled out.

Special abbreviations should be avoided. Thus "boundary conditions" should always be spelled out and not be abbreviated as "b.c." even if this special abbreviation is defined somewhere in the text.

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Statistics in Genetics and in the Environmental Sciences. Edited by Luisa Turrin Fernholz, Stephan Morgenthaler, and Werner Stahel, Birkhäuser Verlag, 2001, xiv + 183 pp., $74.95

This is a volume in the series Trends in Mathematics. The 12 papers in it are based on the talks presented at the Workshop on Statistics and the Sciences, held at the Centro Stefano Franscini in Ascona, Switzerland, May 23 to 28, 1999. The articles range from human and animal genetic DNA research to carcinogens and chemical concentrations in the environment and to space debris and atmospheric chemistry, and include some on applicable general statistical methods.

Generalized Riccati Theory and Robust Control — A Popov Function Approach. By V. Ionescu, C. Oară, and M. Wiss, Wiley, 1999, xii + 380 pp., $125.00

This book is a comprehensive presentation of an original approach—which the authors call the Popov function approach—to the theory of the algebraic Riccati equation and its application to the robust control of linear dynamical systems. Part I outlines in two chapters some background as well as more advanced results in linear algebra. Part II embodies a comprehensive presentation of general results on the Riccati equation. Part III consists of five chapters comprising mathematical problems from the realm of systems theory and robust control. Table of Contents: Part I. General Matrix Theory and Linear Dynamic Systems. 1. Matrices, matrix pencils, and rational matrix functions; 2. Linear dynamic systems; Part II. Generalized Riccati Theory. 3. Popov triplets; 4. Riccati theory: an operator-based approach; 5. Riccati equations and matrix pencils: the regular case; 6. Riccati systems and matrix pencils: the general case; Part III. Applications to Systems Theory and Robust Control. 7. Applications to systems theory; 8. The four-block Nehari problem; 9. The optimal H^2-control problem; 10. The H^∞-control problem; 11. Robust stabilization. There is a bibliography with about 125 items.

Systems of Conservation Laws, Volume 1—Hyperbolicity, Entropies, Shock Waves. By Denis Serre, translated by Ian N. Sneddon, Cambridge University Press, 1999, xxii + 263 pp., $69.95

The conservation laws that are the subject of this work are those of physics or mechanics, when the state of the system considered is a vector-valued function of space variables $x = (x_1, \ldots, x_d)$ and of time t. Chapter headings: 1. Some models; 2. Scalar equations in dimension $d = 1$; 3. Linear and quasi-linear systems; 4. Dimension $d = 1$, the Riemann problem; 5. The Glimm scheme; 6. Second order perturbations; 7. Viscosity profiles for shock waves.

Wavelets in Physics. Edited by J. C. van den Berg, Cambridge University Press, 1999, xxii + 453 pp., $95.00

This book surveys the application of the recently developed technique of the wavelet transform to a wide range of physical fields, including astrophysics, turbulence, meteorology, plasma physics, atomic and solid state physics, and multifractals occurring in physics, biophysics, and mathematical physics. There are 11 papers, preceded by a guided tour through the book by the editor: 1. Wavelet analysis: a new tool in physics; 2. The 2-D wavelet transform, physical applications and generalizations; 3. Wavelets and astrophysical applications; 4. Turbulence analysis, modelling and computing using wavelets; 5. Wavelets and detection of coherent structures in fluid turbulence; 6. Wavelets, non-linearity and turbulence in fusion plasmas; 7. Transfers and fluxes of wind kinetic energy between orthogonal wavelet components during atmospheric blocking; 8. Wavelets in atomic physics and in solid state physics; 9. The thermodynamics of fractals revisited with wavelets; 10. Wavelets in medicine and physiology; 11. Wavelet dimension and time evolution.

Physical Problems Solved by the Phase-Integral Method. By Nanny Fröman and Per Olof Fröman, Cambridge University Press, 2002, xiii + 214 pp., $75.00

This book provides a thorough introduction to the phase-integral method, an efficient approximation method for the analysis and solution of problems in theoretical physics and applied mathematics. It contains a discussion of 50 problems from quantum mechanics, with solutions, of varying degrees of difficulty, but the method has important applications in any field of science involving second-order differential equations. In addition to the description of the method (chapter 2) and problems with solutions (chapter 3), the first chapter presents a historical survey, in two sections, developments from 1817 to 1926, and after 1926, respectively.

Bäcklund and Darboux Transformations—Geometry and Modern Applications in Soliton Theory. By C. Rogers and W. K. Schief, Cambridge University Press, 2002, Hardback $95.00, Paperback $35.00

This is a volume in the series Cambridge Texts in Applied Mathematics. It describes the deep connections that exist between classical differential geometry of surfaces and modern soliton theory and explores the extensive body of literature from the nineteenth and early twentieth centuries by geometers such as Bianchi, Darboux, Bäcklund, and Eisenhart on transformations of classes of surfaces which leave key geometric properties unchanged, amongst which Bäcklund-Darboux transformations are prominent. Chapter headings: 1. Pseudospherical surfaces and the classical Bäcklund transformation. The Bianchi system; 2. The motion of curves and surfaces. Soliton connections; 3. Tzitzeica surfaces. Conjugate nets and the Toda lattice scheme; 4. Hasimoto surfaces and the non-linear Schrödinger equation. Geometry and associated soliton equations; 5. Isothermic surfaces. The Calapso and Zoomeron equations; 6. General aspects of soliton surfaces. Role of gauge and reciprocal transformations; 7. Bäcklund transformation and Darboux matrix connections; 8. Bianchi and Ernst systems. Bäcklund transformations and permutability theorems; 9. Projective-minimal and isothermal-asymptotic surfaces.

Methods of Multivariate Statistics. By M. S. Srivastava, John Wiley & Sons, 2002, xix + 697 pp., $115.00

This is a volume in the Wiley Series in Probability and Mathematical Statistics. It presents an up-to-date account of the subject and represents the most complete account at its level available, the level being appropriate for senior undergraduate students in statistics and first-year graduate students from various disciplines such as biostatistics, psychology, computer science, engineering, and forestry. For each new topic, the author presents not only a description of the problem and its solution, but also several worked examples, often drawn from real life and including the SAS code. That the book includes topics not usually presented in a text at this level, is apparent from the chapter headings: 1. Multivariate methods: an overview; 2. Multivariate normal distributions; 3. Outlier detection and normality check; 4. Inference on location—Hotelling's T^2; 5. Repeated measures; 6. Multivariate analysis of variance; 7. Profile analysis; 8. Classification and discrimination; 9. Multivariate regression; 10. Growth curve models; 11. Principal component analysis; 12. Factor analysis; 13. Inference on covariance matrices; 14. Correlations; 15. Missing observations: general case; 16. Missing observations: monotone sample; 17. Bootstrapping; 18. Imputing missing data. There is an appendix with some results on matrices. The bibliography contains 382 items.