Pacific Journal of Mathematics

VOLUME CLIII 1992

PACIFIC JOURNAL OF MATHEMATICS **EDITORS**

V. S. Varadarajan (Managing Editor) University of California Los Angeles, CA 90024-1555-05

HERBERT CLEMENS University of Utah Salt Lake City, UT 84112

F. MICHAEL CHRIST University of California Los Angeles, CA 90024-1555

THOMAS ENRIGHT University of California, San Diego

La Jolla, CA 92093

NICHOLAS ERCOLANI University of Arizona Tucson, AZ 85721

R. FINN Stanford University Stanford, CA 94305

VAUGHAN F. R. JONES University of California Berkeley, CA 94720

STEVEN KERCKHOFF Stanford University Stanford, CA 94305

C. C. Moore

University of California Berkeley, CA 94720

MARTIN SCHARLEMANN University of California Santa Barbara, CA 93106

HAROLD STARK

University of California, San Diego

La Jolla, CA 92093

ASSOCIATE EDITORS

R. ARENS

E. F. BECKENBACH (1906-1982)

B. H. NEUMANN

F. Wolf

K. Yoshida

(1904-1989)

SUPPORTING INSTITUTIONS

UNIVERSITY OF ARIZONA UNIVERSITY OF BRITISH COLUMBIA CALIFORNIA INSTITUTE OF TECHNOLOGY UNIVERSITY OF CALIFORNIA MONTANA STATE UNIVERSITY UNIVERSITY OF NEVADA, RENO NEW MEXICO STATE UNIVERSITY **OREGON STATE UNIVERSITY**

UNIVERSITY OF OREGON UNIVERSITY OF SOUTHERN CALIFORNIA STANFORD UNIVERSITY UNIVERSITY OF HAWAII UNIVERSITY OF TOKYO UNIVERSITY OF UTAH WASHINGTON STATE UNIVERSITY UNIVERSITY OF WASHINGTON

CONTENTS

A - ALGEBRA AND NUMBER THEORY

F : 0	277
S. M. Goberstein, On orthodox semigroups determined by their bundles of correspondences	71
M. Reeder, On certain Iwahori invariants in the unramified prin-	313
R. Vidal, See F. Dumas and R. Vidal	313
B – ANALYSIS	
P. Ahern and C. Cascante, Exceptional sets for Poisson integrals	1
of potentials on the unit sphere in \mathbb{C}^n , $p \leq 1 \ldots$ H. Bercovici and D. Voiculescu, Lévy-Hinčin type theorems for	1
multiplicative and additive free convolution	
D. P. Blecher, The standard dual of an operator space L. J. Bunce and CH. Chu, Compact operations, multipliers and	15
·	249
C. Cascante, See P. Ahern and C. Cascante	
CH. Chu, See L. J. Bunce and CH. Chu	
M. Dădărlat, G. Nagy, A. Némethi, and C. Pasnicu, Reduction of topological stable rank in inductive limits of C*-algebras	267
M. E. H. Ismail and X. Li, On sieved orthogonal polynomials IX:	207
Orthogonality on the unit circle	289
Y. Konishi, M. Nagisa, and Y. Watatani, Some remarks on actions	110
of compact matrix quantum groups on C*-algebras X. Li, See M. E. H. Ismail and X. Li	119
X. T. Liang and Y. W. Lu, A Phragmén-Lindelöf theorem	299
Y. W. Lu, See X. T. Liang and Y. W. Lu	
J. Marafino, Boundary behavior of a conformal mapping	147
J. Min, A remark on the symmetry of solutions to nonlinear elliptic equations	157
M. Nagisa, See Y. Konishi, M. Nagisa, and Y. Watatani	137
G. Nagy, See M. Dădărlat, G. Nagy, A. Némethi, and C. Pasnicu	
A. Némethi, See M. Dădărlat, G. Nagy, A. Némethi, and C. Pasnicu	
P. Nevai and W. Van Assche, Compact perturbations of orthogonal polynomials	163

C. Pasnicu, See M. Dădărlat, G. Nagy, A. Némethi, and C. Pasnicu	
S. Tanaka, On the representation of the determinant of Harish-	343
	185
W. Van Assche, See P. Nevai and W. Van Assche	
D. Voiculescu, See H. Bercovici and D. Voiculescu	
Y. Watatani, See Y. Konishi, M. Nagisa, and Y. Watatani	
D – GEOMETRY	
G. G. Liao and LF. Tam, On the heat equation for harmonic maps from non-compact manifolds	129
G – TOPOLOGY	
R. Ayala, E. Domínguez, A. Márquez, and A. Quintero, Lusternik-Schnirelmann invariants in proper homotopy theory	201
E. Domínguez, See R. Ayala, E. Domínguez, A. Márquez, and A. Quintero	
P. Gilmer, Real algebraic curves and link cobordism	31
J. Kalliongis and D. McCullough, <i>Homeotopy groups of irreducible</i>	
3-manifolds which may contain two-sided projective planes.	85
A. Márquez, See R. Ayala, E. Domínguez, A. Márquez, and A. Quintero	
D. McCullough, See J. Kalliongis and D. McCullough	
A. Quintero, See R. Ayala, E. Domínguez, A. Márquez, and A. Quintero	
G. Skordev, See F. von Haeseler and G. Skordev	
F. von Haeseler and G. Skordev, Borsuk-Ulam theorem, fixed point index and chain approximations for maps with mul-	260
tiplicity	369

Pacific Journal of Mathematics

P. Ahern and C. Cascante, Exceptional sets for Poisson integrals of potentials on	
the unit sphere in \mathbb{C}^n , $p \leq 1 \dots$	1
D. P. Blecher, The standard dual of an operator space	15
P. Gilmer, Real algebraic curves and link cobordism	31
S. M. Goberstein, On orthodox semigroups determined by their bundles of corre-	
spondences	71
J. Kalliongis and D. McCullough, Homeotopy groups of irreducible 3-manifolds	
which may contain two-sided projective planes	85
Y. Konishi, M. Nagisa, and Y. Watatani, Some remarks on actions of compact	
matrix quantum groups on C^* -algebras	119
G. G. Liao and Luen-Fai Tam, On the heat equation for harmonic maps from	
non-compact manifolds	129
J. Marafino, Boundary behavior of a conformal mapping	147
J. Min, A remark on the symmetry of solutions to nonlinear elliptic equations .	157
P. Nevai and W. Van Assche, Compact perturbations of orthogonal polynomials	163
K. Tintarev, Level set maxima and quasilinear elliptic problems	185

PACIFIC JOURNAL OF MATHEMATICS EDITORS

V. S. VARADARAJAN (Managing Editor) University of California Los Angeles, CA 90024-1555-05

HERBERT CLEMENS University of Utah Salt Lake City, UT 84112

F. MICHAEL CHRIST University of California Los Angeles, CA 90024-1555

THOMAS ENRIGHT University of California, San Diego La Jolla, CA 92093 NICHOLAS ERCOLANI University of Arizona Tucson, AZ 85721

R. FINN Stanford University Stanford, CA 94305

VAUGHAN F. R. JONES University of California Berkeley, CA 94720

STEVEN KERCKHOFF Stanford University Stanford, CA 94305 C. C. Moore

University of California Berkeley, CA 94720

MARTIN SCHARLEMANN University of California Santa Barbara, CA 93106

HAROLD STARK

University of California, San Diego

La Jolla, CA 92093

ASSOCIATE EDITORS

R. Arens

E. F. BECKENBACH (1906-1982)

B. H. Neumann

F. Wolf (1904-1989) K. Yoshida

SUPPORTING INSTITUTIONS

UNIVERSITY OF ARIZONA
UNIVERSITY OF BRITISH COLUMBIA
CALIFORNIA INSTITUTE OF TECHNOLOGY
UNIVERSITY OF CALIFORNIA
MONTANA STATE UNIVERSITY
UNIVERSITY OF NEVADA, RENO
NEW MEXICO STATE UNIVERSITY
OREGON STATE UNIVERSITY

UNIVERSITY OF OREGON
UNIVERSITY OF SOUTHERN CALIFORNIA
STANFORD UNIVERSITY
UNIVERSITY OF HAWAII
UNIVERSITY OF TOKYO
UNIVERSITY OF UTAH

WASHINGTON STATE UNIVERSITY UNIVERSITY OF WASHINGTON

The Supporting Institutions listed above contribute to the cost of publication of this Journal, but they are not owners or publishers and have no responsibility for its content or policies.

Mathematical papers intended for publication in the Pacific Journal of Mathematics should be in typed form or offset-reproduced (not dittoed), double spaced with large margins. Please do not use built up fractions in the text of the manuscript. However, you may use them in the displayed equations. Underline Greek letters in red, German in green, and script in blue. The first paragraph must be capable of being used separately as a synopsis of the entire paper. In particular it should contain no bibliographic references. Please propose a heading for the odd numbered pages of less than 35 characters. Manuscripts, in triplicate, may be sent to any one of the editors. Please classify according to the 1991 Mathematics Subject Classification scheme which can be found in the December index volumes of Mathematical Reviews. Supply name and address of author to whom proofs should be sent. All other communications should be addressed to the managing editor, or Elaine Barth, University of California, Los Angeles, California 90024-1555-05.

There are page-charges associated with articles appearing in the Pacific Journal of Mathematics. These charges are expected to be paid by the author's University, Government Agency or Company. If the author or authors do not have access to such Institutional support these charges are waived. Single authors will receive 50 free reprints; joint authors will receive a total of 100 free reprints. Additional copies may be obtained at cost in multiples of 50.

The *Pacific Journal of Mathematics* (ISSN 0030-8730) is published monthly except for July and August. Regular subscription rate: \$190.00 a year (10 issues). Special rate: \$95.00 a year to individual members of supporting institutions.

Subscriptions, orders for numbers issued in the last three calendar years, and changes of address should be sent to Pacific Journal of Mathematics, P.O. Box 969, Carmel Valley, CA 93924, U.S.A. Old back numbers obtainable from Kraus Periodicals Co., Route 100, Millwood, NY 10546.

The Pacific Journal of Mathematics at P.O. Box 969, Carmel Valley, CA 93924 (ISSN 0030-8730) is published monthly except for July and August. Second-class postage paid at Carmel Valley, California 93924, and additional mailing offices. Postmaster: send address changes to Pacific Journal of Mathematics, P.O. Box 969, Carmel Valley, CA 93924.