MATHEMATICAL JOURNAL OF OKAYAMA UNIVERSITY

VOL. 65 2023

PUBLISHED BY

DEPARTMENT OF MATHEMATICS FACULTY OF SCIENCE OKAYAMA UNIVERSITY OKAYAMA, JAPAN

MATHEMATICAL JOURNAL OF OKAYAMA UNIVERSITY

FOUNDED BY M. MORIYA, T. INAGAKI, M. OSIMA, T. OTSUKI

EDITED BY

Masao ISHIKAWA* Kei KONDO Yoshihito OSHITA Takeshi TORII Masao JINZENJI Masaharu TANIGUCHI Naoki TERAI

(*: Managing Editor)

Each volume consists of two numbers, and each number which contains about 100 pages will appear semi-annually.

According to circumstances, there are some cases where one volume containing about 200 pages appears annually.

All communications relating to this publication should be addressed to

Mathematical Journal of Okayama University Department of Mathematics Faculty of Science

Okayama University
Okayama 700-8530, Japan

E-mail: mjou@okayama-u.ac.jp, journal@math.okayama-u.ac.jp Information for authors is to be found on the inside back cover.

Visit our web site

http://www.math.okayama-u.ac.jp/mjou/

Copyright©2023 by the Editorial Board of Mathematical Journal of Okayama University

Information for authors

Submission of Manuscripts

- (1) Articles on pure and applied mathematics intended for publication in *Mathematical Journal of Okayama University* should be written in English.
- (2) Only original papers not yet published and not simultaneously submitted for publication elsewhere will be accepted.
- (3) Electronically prepared manuscripts in printable files (dvi or pdf) can be sent via e-mail to:

mjou@okayama-u.ac.jp, journal@math.okayama-u.ac.jp

- (4) Electronic submission in LaTeX style is preferred. If you are unable to submit your manuscript electronically, you should send two hard copies to the Editorial Office of Mathematical Journal of Okayama University, Department of Mathematics, Okayama University, Okayama 700-8530, Japan.
- (5) After acceptance for publication, authors will be requested to send a LaTeX file coded with the style file "jokayama.cls" which (together with all necessary additional information on how to use the style sheet) is available at our homepage:

http://www.math.okayama-u.ac.jp/mjou/.

Proofs

Authors will receive page proofs, preferably by e-mail in PDF format. Corrections should be confined to typographical errors. Authors will be charged for excessive corrections. Please correct your galley proofs and return them within 14 days together with the signed copyright agreement.

Reprints

The corresponding author will receive 50 hardcopy reprints free of charge, this number to be shared between joint authors.

Edit and Publishing:

Department of Mathematics, Faculty of Science, Okayama University Okayama, JAPAN

Design and Printing Office:

Showa Printing Co. Ltd.
3-1-27 Toyonari Minami-ku Okayama-shi Okayama 700-0942, Japan
Phone +81-86-264-6110 Faximile +81-86-262-5096

CONTENTS

	Page
Hoshi, Y. A Note on Fields Generated by Jacobi Sums	117
Kametaka, Y., Watanabe, K., Nagai, N., Takemura, K. and Yamagishi, H. Positivity and Hierarchical Structure of four Green Functions Corresponding to a Bending Problem of a Beam on a half line	145
Kato, R. $E(2)$ -local Picard graded beta elements at the prime three	23
Kinjo, T. Non-Modular Solution of the Kaneko-Zagier Equations with respect to Fricke Groups of Low Levels	83
Koike, K. A characterization of the class of Harada rings	1
Kusuoka, Sei. An improvement of the integrability of the state space of the Φ_3^4 -process and the support of the Φ_3^4 -measure constructed by the limit of stationary processes of approximating stochastic quantization equations	97
Morita, J., Pianzola, A. and Shibata, T. Affine Kac-Moody Groups as Twisted Loop Groups obtained by Galois Descent Considerations	35
Wah Wah and Taniguchi, M. Traveling front solutions for perturbed reaction-diffusion equations	125

JANUARY 2023

Vol. 65

CONTENTS

	Page
Koike, K. A characterization of the class of Harada rings	1
Kato, R. $E(2)$ -local Picard graded beta elements at the prime three	23
MORITA, J., PIANZOLA, A. AND SHIBATA, T. Affine Kac-Moody Groups as Twisted Loop Groups obtained by Galois Descent Considerations	35
KINJO, T. Non-Modular Solution of the Kaneko-Zagier Equations with respect to Fricke Groups of Low Levels	83
Kusuoka, Sei. An improvement of the integrability of the state space of the Φ_3^4 -process and the support of the Φ_3^4 -measure constructed by the limit of stationary processes of approximating stochastic quantization equations	97
Hoshi, Y. A Note on Fields Generated by Jacobi Sums	117
Wah Wah and Taniguchi, M. Traveling front solutions for perturbed reaction-diffusion equations	125
Kametaka, Y., Watanabe, K., Nagai, N., Takemura, K. and Yamagishi, H. Positivity and Hierarchical Structure of four Green Functions Corresponding to a Bending Problem of a Beam on a half line	145

A CHARACTERIZATION OF THE CLASS OF HARADA RINGS

KAZUTOSHI KOIKE

$E(2)\mbox{-}\mbox{LOCAL PICARD GRADED BETA ELEMENTS AT THE PRIME THREE}$

Ryo KATO

AFFINE KAC-MOODY GROUPS AS TWISTED LOOP GROUPS OBTAINED BY GALOIS DESCENT CONSIDERATIONS

Dedicated to Professor Robert V. Moody on the occasion of his 80th birthday.

JUN MORITA, ARTURO PIANZOLA AND TAIKI SHIBATA

NON-MODULAR SOLUTION OF THE KANEKO-ZAGIER EQUATIONS WITH RESPECT TO FRICKE GROUPS OF LOW LEVELS

TOSHITERU KINJO

AN IMPROVEMENT OF THE INTEGRABILITY OF THE STATE SPACE OF THE Φ_3^4 -PROCESS AND THE SUPPORT OF THE Φ_3^4 -MEASURE CONSTRUCTED BY THE LIMIT OF STATIONARY PROCESSES OF APPROXIMATING STOCHASTIC QUANTIZATION EQUATIONS

SEIICHIRO KUSUOKA

A NOTE ON FIELDS GENERATED BY JACOBI SUMS

Yuichiro HOSHI

TRAVELING FRONT SOLUTIONS FOR PERTURBED REACTION-DIFFUSION EQUATIONS

WAH WAH AND MASAHARU TANIGUCHI

POSITIVITY AND HIERARCHICAL STRUCTURE OF FOUR GREEN FUNCTIONS CORRESPONDING TO A BENDING PROBLEM OF A BEAM ON A HALF LINE

YOSHINORI KAMETAKA, KOHTARO WATANABE, ATSUSHI NAGAI, KAZUO TAKEMURA AND HIROYUKI YAMAGISHI