St. Petersburg Mathematical Journal

(Formerly Leningrad Mathematical Journal)

Volume 20 Number 2 April 2009

A Translation of

РОССИЙСКАЯ АКАДЕМИЯ НАУК

АЛГЕБРА И АНАЛИЗ

ТОМ 20 № 2 2008

American Mathematical Society

Providence, Rhode Island USA

ISSN 1061-0022

ST. PETERSBURG MATHEMATICAL JOURNAL
(Formerly Leningrad Mathematical Journal)
A translation of the Russian bimonthly
Алгебра и анализ
"Наука", С.-Петербургское отделение, 2008 г.

Editorial Board

A. B. Aleksandrov
A. N. Andrianov
(Deputy Editor-in-Chief)
V. M. Babich
A. D. Baranov
(Executive Secretary)
M. Sh. Birman
V. S. Buslaev
S. V. Buyalo
O. Ya. Viro
S. V. Kislyakov
(Editor-in-Chief)
P. P. Kulish
N. Yu. Netsvetaev
N. K. Nikol′skiĭ
A. N. Parshin
M. A. Semenov-Tyan-Shanskiĭ
A. A. Suslin
N. N. Ural′tseva
(Deputy Editor-in-Chief)
V. P. Khavin
A. L. Chistov
A. V. Yakovlev

SUBSCRIPTION INFORMATION. The 2009 subscription is for one volume of six issues. Beginning in 2004, *St. Petersburg Mathematical Journal* is accessible from `www.ams.org/journals/`. Subscription prices for Volume 20 are US$1881 list, US$1505 institutional member. Upon request, subscribers to paper delivery of this journal are also entitled to receive electronic delivery. For paper delivery, subscribers outside the United States and India must pay a postage surcharge of US$18; subscribers in India must pay a postage surcharge of US$28. Expedited delivery to destinations in North America US$32; elsewhere US$70. A late charge of 10% of the subscription price will be imposed upon orders received from nonmembers after January 1 of the subscription year.

BACK NUMBER INFORMATION. For back issues see `www.ams.org/bookstore`.

Orders for subscriptions and publications of the American Mathematical Society should be addressed to the American Mathematical Society, P.O. Box 845904, Boston, MA 02284-5904 USA. *All orders must be accompanied by payment.* Other correspondence should be addressed to 201 Charles Street, Providence, RI 02904-2294 USA.

COPYING AND REPRINTING. Material in this journal may be reproduced by any means for educational and scientific purposes without fee or permission with the exception of reproduction by services that collect fees for delivery of documents and provided that the customary acknowledgment of the source is given. This consent does not extend to other kinds of copying for general distribution, for advertising or promotional purposes, or for resale. Requests for permission for commercial use of material should be addressed to the Acquisitions Department, American Mathematical Society, 201 Charles Street, Providence, RI 02904-2294 USA. Requests can also be made by e-mail to `reprint-permission@ams.org`.

St. Petersburg Mathematical Journal (ISSN 1061-0022) is published bimonthly by the American Mathematical Society, 201 Charles Street, Providence, RI 02904-2294 USA. Periodicals postage paid at Providence, Rhode Island. Postmaster: Send address changes to St. Petersburg Mathematical Journal, American Mathematical Society, 201 Charles Street, Providence, RI 02904-2294 USA.

Manuscripts should be addressed to "Algebra i Analiz", St. Petersburg Publishing Company of the Russian Academy of Sciences, Mendeleevskaya Liniya 1, St. Petersburg 199034, Russia. Submitting simultaneously a tex-file to the address `pmj@pdmi.ras.ru` is highly appreciated.

© 2009 American Mathematical Society. All rights reserved.

This journal is indexed in *Mathematical Reviews* and *Zentralblatt MATH*.
This journal is archived in *Portico*.
Translation authorized by the All-Union Agency for Author's Rights, Moscow.
Printed in the United States of America.
♾ The paper used in this journal is acid-free and falls within the guidelines established to ensure permanence and durability.

10 9 8 7 6 5 4 3 2 1 14 13 12 11 10 09

The Editorial Board
cordially congratulates
Mikhail Shlëmovich Birman
on his 80th birthday.

St. Petersburg Mathematical Journal

(Formerly Leningrad Mathematical Journal)

Volume 20 Number 2 April 2009

A Translation of

РОССИЙСКАЯ АКАДЕМИЯ НАУК

АЛГЕБРА И АНАЛИЗ

ТОМ 20 № 2 2008

American Mathematical Society

Providence, Rhode Island USA
ISSN 1061-0022

ST. PETERSBURG MATHEMATICAL JOURNAL
(Formerly Leningrad Mathematical Journal)
A translation of the Russian bimonthly
Алгебра и анализ
"Наука", С.-Петербургское отделение, 2008 г.

Editorial Board

A. B. Aleksandrov
A. N. Andrianov
(Deputy Editor-in-Chief)
V. M. Babich
A. D. Baranov
(Executive Secretary)
M. Sh. Birman
V. S. Buslaev
S. V. Buyalo
O. Ya. Viro
S. V. Kislyakov
(Editor-in-Chief)
P. P. Kulish
N. Yu. Netsvetaev
N. K. Nikol′skiĭ
A. N. Parshin
M. A. Semenov-Tyan-Shanskiĭ
A. A. Suslin
N. N. Ural′tseva
(Deputy Editor-in-Chief)
V. P. Khavin
A. L. Chistov
A. V. Yakovlev

SUBSCRIPTION INFORMATION. The 2009 subscription is for one volume of six issues. Beginning in 2004, *St. Petersburg Mathematical Journal* is accessible from `www.ams.org/journals/`. Subscription prices for Volume 20 are US$1881 list, US$1505 institutional member. Upon request, subscribers to paper delivery of this journal are also entitled to receive electronic delivery. For paper delivery, subscribers outside the United States and India must pay a postage surcharge of US$18; subscribers in India must pay a postage surcharge of US$28. Expedited delivery to destinations in North America US$32; elsewhere US$70. A late charge of 10% of the subscription price will be imposed upon orders received from nonmembers after January 1 of the subscription year.

BACK NUMBER INFORMATION. For back issues see `www.ams.org/bookstore`.

Orders for subscriptions and publications of the American Mathematical Society should be addressed to the American Mathematical Society, P.O. Box 845904, Boston, MA 02284-5904 USA. *All orders must be accompanied by payment.* Other correspondence should be addressed to 201 Charles Street, Providence, RI 02904-2294 USA.

COPYING AND REPRINTING. Material in this journal may be reproduced by any means for educational and scientific purposes without fee or permission with the exception of reproduction by services that collect fees for delivery of documents and provided that the customary acknowledgment of the source is given. This consent does not extend to other kinds of copying for general distribution, for advertising or promotional purposes, or for resale. Requests for permission for commercial use of material should be addressed to the Acquisitions Department, American Mathematical Society, 201 Charles Street, Providence, RI 02904-2294 USA. Requests can also be made by e-mail to `reprint-permission@ams.org`.

St. Petersburg Mathematical Journal (ISSN 1061-0022) is published bimonthly by the American Mathematical Society, 201 Charles Street, Providence, RI 02904-2294 USA. Periodicals postage paid at Providence, Rhode Island. Postmaster: Send address changes to St. Petersburg Mathematical Journal, American Mathematical Society, 201 Charles Street, Providence, RI 02904-2294 USA.

Manuscripts should be addressed to "Algebra i Analiz", St. Petersburg Publishing Company of the Russian Academy of Sciences, Mendeleevskaya Liniya 1, St. Petersburg 199034, Russia. Submitting simultaneously a tex-file to the address `pmj@pdmi.ras.ru` is highly appreciated.

© 2009 American Mathematical Society. All rights reserved.

This journal is indexed in *Mathematical Reviews* and *Zentralblatt MATH*.
This journal is archived in *Portico*.
Translation authorized by the All-Union Agency for Author's Rights, Moscow.
Printed in the United States of America.
♾ The paper used in this journal is acid-free and falls within the guidelines established to ensure permanence and durability.

10 9 8 7 6 5 4 3 2 1 14 13 12 11 10 09

CONTENTS

Research Papers

Yu. S. Belov, Model functions with nearly prescribed modulus 163
D. Borisov, Asymptotics for the solutions of elliptic systems with rapidly oscillating coefficients 175
V. V. Vlasov and S. A. Ivanov, Sharp estimates for solutions of systems with aftereffect 193
D. Gurevich, P. Pyatov, and P. Saponov, Representation theory of (modified) reflection equation algebra of $GL(m|n)$ type 213
A. M. Petrunin, An upper bound for the curvature integral 255
M. A. Pribyl′, Spectral analysis of linearized stationary equations of viscous compressible fluid in $\mathbb{R}^3$, with periodic boundary conditions 267
K. V. Trunov and R. S. Yulmukhametov, Quasianalytic Carleman classes on bounded domains 289

Easy Reading for Professionals

S. Yu. Favorov, Lagrange's mean motion problem 319

RUSSIAN CONTENTS*

Статьи

Белов Ю. С. Модельные функции с почти предписанным модулем 3

Борисов Д. И. Асимптотики решений эллиптических систем с быстро осциллирующими коэффициентами 19

Власов В. В., Иванов С. А. Точные оценки решений систем уравнений с последействием 43

Гуревич Д. И., Пятов П. Н., Сапонов П. А. Теория представлений алгебры (модифицированного) уравнения отражений $GL(m|n)$ типа 70

Петрунин А. М. Верхняя оценка на интеграл кривизны 134

Прибыль М. А. Спектральный анализ линеаризованных стационарных уравнений вязкой сжимаемой жидкости, заданных в $\mathbb{R}^3$ с периодическими краевыми условиями 149

Трунов К. В., Юлмухаметов Р. С. Квазианалитические классы Карлемана на ограниченных областях 178

Лёгкое чтение для профессионала

Фаворов С. Ю. Проблема Лагранжа о среднем движении . . . 218

*The American Mathematical Society scheme for transliteration of Cyrillic may be found at the end of index issues of *Mathematical Reviews*.

St. Petersburg Mathematical Journal VOLUME 20 NUMBER 2 APRIL 2009