NOTES ON NUMERICAL FLUID MECHANICS AND MULTIDISCIPLINARY DESIGN · VOLUME 93

Advances in High Performance Computing and Computational Sciences

The 1st Kazakh-German Advanced Research Workshop, Almaty, Kazakhstan, September 25 – October 1, 2005

Yuri Shokin, Michael Resch, Nargozy Danaev, Murat Orunkhanov, Nina Shokina (Eds.)

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Yurii Shokin
Michael Resch
Nargozy Danaev
Murat Orunkhanov
Nina Shokina
(Editors)

Springer

Prof. Dr. Yurii Shokin
Institute of Computational Technologies of SB RAS
Ac. Lavrentyev Ave. 6
630090 Novosibirsk
Russia

Prof. Dr. Michael Resch
Dr. Nina Shokina
High Performance Computing Center Stuttgart (HLRS)
University of Stuttgart
Nobelstraße 19
70569 Stuttgart
Germany

Prof. Dr. Nargozy Danaev
Prof. Dr. Murat Orunkhanov
Institute of Mathematics and Mechanics
Al-Farabi Kazakh National University
Masanchi str. 39/47
050012 Almaty
Kazakhstan

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NNFM Editor Addresses

Prof. Dr. Ernst Heinrich Hirschel
(General editor)
Herzog-Heinrich-Weg 6
D-85604 Zorneding
Germany
E-mail: e.h.hirschel@t-online.de

Prof. Dr. Kozo Fujii
Space Transportation Research Division
The Institute of Space
and Astronautical Science
3-1-1, Yoshinodai, Sagamihara
Kanagawa, 229-8510
Japan
E-mail: fujii@flab.eng.isas.jaxa.jp

Dr. Werner Haase
Höhenkirchener Str. 19d
D-85662 Hohenbrunn
Germany
E-mail: werner@haa.se

Prof. Dr. Bram van Leer
Department of Aerospace Engineering
The University of Michigan
Ann Arbor, MI 48109-2140
USA
E-mail: bram@engin.umich.edu

Prof. Dr. Michael A. Leschziner
Imperial College of Science
Technology and Medicine
Aeronautics Department
Prince Consort Road
London SW7 2BY
U. K.
E-mail: mike.leschziner@ic.ac.uk

Prof. Dr. Maurizio Pandolfi
Politecnico di Torino
Dipartimento di Ingegneria
Aeronautica e Spaziale
Corso Duca degli Abruzzi, 24
I-10129 Torino
Italy
E-mail: pandolfi@polito.it

Prof. Dr. Jacques Periaux
Dassault Aviation
78, Quai Marcel Dassault
F-92552 St. Cloud Cedex
France
E-mail: jperiaux@free.fr

Prof. Dr. Arthur Rizzi
Department of Aeronautics
KTH Royal Institute of Technology
Teknikringen 8
S-10044 Stockholm
Sweden
E-mail: rizzi@kth.se

Dr. Bernard Roux
L3M – IMT La Jetée
Technopole de Chateau-Gombert
F-13451 Marseille Cedex 20
France
E-mail: broux@l3m.univ-mrs.fr

Prof. Dr. Yurii I. Shokin
Siberian Branch of the
Russian Academy of Sciences
Institute of Computational
Technologies
Ac. Lavrentyeva Ave. 6
630090 Novosibirsk
Russia
E-mail: shokin@ict.nsc.ru

Preface

This volume is published as the proceedings of the first Kazakh-German Advanced Research Workshop on Computational Science and High Performance Computing in Almaty, Kazakhstan, on September 25 - October 1, 2005.

The contributions of these proceedings were provided and edited by the authors, chosen after a careful selection and reviewing process.

The workshop was organized by the High Performance Computing Center Stuttgart (Stuttgart, Germany), al-Farabi Kazakh National University (Almaty, Kazakhstan) and the Institute of Computational Technologies SB RAS (Novosibirsk, Russia) in the framework of activities of the German-Russian Center for Computational Technologies and High Performance Computing.

In March 2005, further to the long-term collaboration between German and Siberian scientists, at Prof. Yurii Shokin's suggestion the Kazakh scientists from the al-Farabi Kazakh National University and Institute of Mathematics and Mechanics (al-Farabi Kazakh National University) have participated in the second Russian-German Advanced Research Workshop on Computational Science and High Performance Computing in Stuttgart, hereby establishing a multilateral cooperation. A keen interest has been shown in developing a close cooperation between German and Kazakh specialists in the field of computational science and high performance computing, giving the possibility of sharing and discussing the latest results and developing further scientific contacts.

The topics of the workshop include numerical modelling in problems on non-linear fiber optics and problems of electrical sounding, high performance computing, numerical modelling of flows in hydro turbines, computational fluid dynamics, visualization of computational modelling results, theory of mathematical methods, numerical modelling in problems on flame propagation, spray combustion and supersonic turbulent jets, smoothed particle hydrodynamics, numerical modelling in industrial problems, large-eddy simulations (LES) of complex flows.

The participation of representatives of major research organizations engaged in the solution of the most complex problems of mathematical mod-

elling, development of new algorithms, programs and key elements of information technologies, elaboration and implementation of software and hardware for high performance computing systems, provided a high level of competence of the workshop.

Among the Kazakh participants were researchers of the al-Farabi Kazakh National University (Almaty), the Institute of Mathematics and Mechanics (al-Farabi Kazakh National University, Almaty), the Institute of Mathematics (Almaty).

Among the German participants were the heads and leading specialists of the High Performance Computing Center Stuttgart (HLRS) (University of Stuttgart), the Institute of Aerodynamics and Gasdynamics (University of Stuttgart), the Institute of Aerodynamics (RWTH Aachen), the Institute of Applied Mathematics (University of Freiburg i. Br.), the Institute of Technical Thermodynamics (University of Karlsruhe(TH)).

Among the Russian participants were researchers of the Institute of Computational Technologies SB RAS (Novosibirsk) and the Sobolev Institute of Mathematics SB RAS (Novosibirsk).

This volume provides state-of-the-art scientific papers, presenting the latest results of the leading German, Kazakh and Russian institutions.

We are glad to see the successful continuation and promising perspectives of the highly professional international scientific meetings, which bring new insights and show the ways of future development in the problems of computational sciences and information technologies.

The editors would like to express their gratitude to all the participants of the workshop and wish them a further successful and fruitful work.

Novosibirsk and Stuttgart,
November 2005

Yurii Shokin
Michael Resch
Nargozy Danaev
Murat Orunkhanov
Nina Shokina

Contents

List of Contributors

N.A. Alkishriwi
Institute of Aerodynamics
RWTH Aachen
Wuelnnerstr. zw. 5 u.7
Aachen, 52062, Germany
office@aia.rwth-aachen.de

G. Balakayeva
Institute of Mathematics and Mechanics
al-Farabi Kazakh National University
Masanchi str. 39/47
Almaty, 480012, Kazakhstan
balakayeva@kazsu.kz

Y. Bogdanov
Institute of Mathematics and Mechanics
al-Farabi Kazakh National University
Masanchi str. 39/47
Almaty, 480012, Kazakhstan
j@dasm.kz

T. Bönisch
High Performance Computing Center Stuttgart (HLRS)
University of Stuttgart
Nobelstraße 19
Stuttgart, 70569, Germany
boenish@hlrs.de

A. Burri
Institute of Applied Mathematics
University of Freiburg i. Br.
Hermann-Herder-Str. 10
Freiburg i. Br., 79104, Germany
burriad@mathematik.uni-freiburg.de

S.G. Cherny
Institute of Computational Technologies SB RAS
Lavrentiev Ave. 6
Novosibirsk, 630090, Russia
cher@ict.nsc.ru

D.V. Chirkov
Institute of Computational Technologies SB RAS
Lavrentiev Ave. 6
Novosibirsk, 630090, Russia
dchirkov@ngs.ru

G. Dairbaeva
al-Farabi Kazakh National University
Al-Farabi av. 71
Almaty, 050078, Kazakhstan
dairbaeva@kazsu.kz

A. Dedner
Institute of Applied Mathematics
University of Freiburg i. Br.

Hermann-Herder-Str. 10
Freiburg i. Br., 79104, Germany
dedner@mathematik.uni-freiburg.de

D. Diehl
Institute of Applied Mathematics
University of Freiburg i. Br.
Hermann-Herder-Str. 10
Freiburg i. Br., 79104, Germany
dennis@mathematik.uni-freiburg.de

M.P. Fedoruk
Institute of Computational Technologies SB RAS
Lavrentiev Ave. 6
Novosibirsk, 630090, Russia
mife@ict.nsc.ru

S. Ganzenmüller
Department of Computer Engineering
University of Tübingen
Sand 13
Tübingen, 72076, Germany
ganzenmu@informtik.uni-tuebingen.de

M. Hipp
Department of Computer Engineering
University of Tübingen
Sand 13
Tübingen, 72076, Germany
hippm@informtik.uni-tuebingen.de

S. Holtwick
Institute of Theoretical Astrophysics
University of Tübingen
Auf der Morgenstelle 10
Tübingen, 72076, Germany
holtwick@tat.physik.uni-tuebingen.de

S.I. Kabanikhin
Sobolev Institute of Mathematics SB RAS
Lavrentiev Ave. 4
Novosibirsk, 630090, Russia
Kazakh–British Technical University
Tolebi ave. 59
Almaty, 050091, Kazakhstan
kabanikh@math.nsc.ru

A. Kaltayev
al-Farabi Kazakh National University
Al-Farabi av. 71
Almaty, 050078, Kazakhstan
kaltayev@kazsu.kz

G.S. Khakimzyanov
Institute of Computational Technologies SB RAS
Lavrentiev Ave. 6
Novosibirsk, 630090, Russia
khak@ict.nsc.ru

R. Klöfkorn
Institute of Applied Mathematics
University of Freiburg i. Br.
Hermann-Herder-Str. 10
Freiburg i. Br., 79104, Germany
robertk@mathematik.uni-freiburg.de

U. Küster
High Performance Computing Center Stuttgart (HLRS)
University of Stuttgart
Nobelstraße 19
Stuttgart, 70569, Germany
kuester@hlrs.de

V.N. Lapin
Institute of Computational Technologies SB RAS
Lavrentiev Ave. 6
Novosibirsk, 630090, Russia
lapvas@ngs.ru

A.S. Lebedev
Institute of Computational Technologies SB RAS
Lavrentiev Ave. 6
Novosibirsk, 630090, Russia
sasa@ict.nsc.ru

S. Lipp
Institute of Technical Thermodynamics
University of Karlsruhe(TH)
Kaiserstraße 12
76131 Karlsruhe, Germany
lipp@itt.mach.uni-karlsruhe.de

I.F. Lobareva
Institute of Computational Technologies SB RAS
Lavrentiev Ave. 6
Novosibirsk, 630090, Russia
irenek@ngs.ru

U. Maas
Institute of Technical Thermodynamics
University of Karlsruhe(TH)
Kaiserstraße 12
76131 Karlsruhe, Germany
maas@itt.mach.uni-karlsruhe.de

M. Meinke
Institute of Aerodynamics
RWTH Aachen
Wuelnnerstr. zw. 5 u.7
Aachen, 52062, Germany
office@aia.rwth-aachen.de

B. Mukanova
Institute of Mathematics and Mechanics
al-Farabi Kazakh National University
Masanchi str. 39/47
Almaty, 480012, Kazakhstan
mubaga@kazsu.kz

A.Zh. Naimanova
Institute of Mathematics
Pushkin str. 125
Almaty, 480100, Kazakhstan
ked@math.kz

M. Ohlberger
Institute of Applied Mathematics
University of Freiburg i. Br.
Hermann-Herder-Str. 10
Freiburg i. Br., 79104, Germany
mario@mathematik.uni-freiburg.de

M. Orunkhanov
Institute of Mathematics and Mechanics
al-Farabi Kazakh National University
Masanchi str. 39/47
Almaty, 480012, Kazakhstan
mubaga@kazsu.kz

S. Pinkenburg
Department of Computer Engineering
University of Tübingen
Sand 13
Tübingen, 72076, Germany
pinkenbu@informtik.uni-tuebingen.de

K.B. Rakhmetova
al-Farabi Kazakh National University
Al-Farabi av. 71
Almaty, 050078, Kazakhstan
nich7@kazsu.kz

G.I. Ramazanova
al-Farabi Kazakh National University
Al-Farabi av. 71
Almaty, 050078, Kazakhstan
nich7@kazsu.kz

M. Resch
High Performance Computing Center Stuttgart (HLRS)
University of Stuttgart
Nobelstraße 19
Stuttgart, 70569, Germany
resch@hlrs.de

W. Rosenstiel
Department of Computer Engineering
University of Tübingen
Sand 13
Tübingen, 72076, Germany
rosen@informtik.uni-tuebingen.de

H. Ruder
Institute of Theoretical Astrophysics
University of Tübingen
Auf der Morgenstelle 10
Tübingen, 72076, Germany
ruder@tat.physik.uni-tuebingen.de

A. Ruprecht
Institute for Fluid Mechanics and Hydraulic Machinery
University of Stuttgart
Pfaffenwaldring 10
Stuttgart, 70550, Germany
ruprecht@ihs.uni-stuttgart.de

W. Schröder
Institute of Aerodynamics
RWTH Aachen
Wuelnnerstr. zw. 5 u.7
Aachen, 52062, Germany
office@aia.rwth-aachen.de

S.V. Sharov
Institute of Computational Technologies SB RAS
Lavrentiev Ave. 6
Novosibirsk, 630090, Russia
serge@ict.nsc.ru

K. Shakenov
al-Farabi Kazakh National University
Al-Farabi av. 71
Almaty, 050078, Kazakhstan
shakenov2000@mail.ru

Yu.I. Shokin
Institute of Computational Technologies SB RAS
Lavrentiev Ave. 6
Novosibirsk, 630090, Russia
shokin@ict.nsc.ru

N.Yu. Shokina
High Performance Computing Center Stuttgart (HLRS)
University of Stuttgart
Nobelstraße 19
Stuttgart, 70569, Germany
shokina@hlrs.de

O.V. Shtyrina
Institute of Computational Technologies SB RAS
Lavrentiev Ave. 6
Novosibirsk, 630090, Russia
shtyrinaov@ngs.ru

V.A. Skorospelov
Sobolev Institute of Mathematics SB RAS
Lavrentiev Ave. 4
Novosibirsk, 630090, Russia
vskrsp@math.nsc.ru

R. Stauch
Institute of Technical Thermodynamics
University of Karlsruhe(TH)
Kaiserstraße 12
76131 Karlsruhe, Germany
stauch@itt.mach.uni-karlsruhe.de

Zh. Ualiev
al-Farabi Kazakh National University
Al-Farabi av. 71
Almaty, 050078, Kazakhstan
kaltayev@kazsu.kz

Q. Zhang
Institute of Aerodynamics
RWTH Aachen
Wuelnnerstr. zw. 5 u.7
Aachen, 52062, Germany
office@aia.rwth-aachen.de

U.K. Zhapbasbaev
al-Farabi Kazakh National University
Al-Farabi av. 71
Almaty, 050078, Kazakhstan
nich7@kazsu.kz