The papers included in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. The papers published in these proceedings reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from this book:


ISSN 0277-786X
ISBN 9780819467515

Published by
SPIE—The International Society for Optical Engineering
P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone 1 360/676-3290 (Pacific Time) · Fax 1 360/647-1445
http://www.spie.org

Copyright © 2007, The Society of Photo-Optical Instrumentation Engineers

Copying of material in this book for internal or personal use, or for the internal or personal use of specific clients, beyond the fair use provisions granted by the U.S. Copyright Law is authorized by SPIE subject to payment of copying fees. The Transactional Reporting Service base fee for this volume is $18.00 per article (or portion thereof), which should be paid directly to the Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923. Payment may also be made electronically through CCC Online at http://www.copyright.com. Other copying for republication, resale, advertising or promotion, or any form of systematic or multiple reproduction of any material in this book is prohibited except with permission in writing from the publisher. The CCC fee code is 0277-786X/07/$18.00.

Printed in the United States of America.
Contents

SESSION 1  LASERS, LASER SYSTEMS

661002  The time and spatial dynamics of the YAG:Nd³⁺/YAG:Cr³⁺ microchip laser emission [6610-01]
A. G. Okhrimchuk, A. V. Shestakov, Elements of Laser Systems Co. (Russia)

661003  Numerical simulating of diode-side-pumped Nd³⁺:YAG rod laser performance [6610-02]
A. J. Abazadze, J. M. Kolbatskov, G. M. Zverev, M. F. Steĺmak Polyus Research and Development Institute (Russia)

661004  Powerful subnanosecond hybrid master oscillator-power amplifier Nd:YAG laser system [6610-03]

661005  Compact neodymium phosphate glass laser emitting 300J/300GW pulses for pumping of a chirped pulse optical parametric amplifier [6610-04]

661006  Hybrid ytterbium doped active medium for femtosecond lasers [6610-05]
E. V. Pestryakov, V. V. Petrov, V. I. Trunov, A. V. Kirpichnikov, A. V. Laptev, M. A. Merziakov, S. N. Bagayev, Institute of Laser Physics [Russia]; V. N. Matrosov, Belarusian Technical Univ. (Belarus)

661007  Some particularities to generations of solid state laser with nonlinear transparency absorber [6610-06]
A. S. Kuchyanov, The Institute of Automation and Electrometry (Russia)
2.94 µm Er:YAG Q-switched laser with Fe²⁺:ZnSe passive shutter [6610-07]
V. A. Akimov, Moscow Institute of Physics and Technology (Russia); M. P. Frolov,
Y. V. Korostelin, V. I. Kozlovsky, A. I. Landman, Y. P. Podmar’kov, Lebedev Physical Institute
(Russia); V. G. Polushkin, Institute of Nuclear Research (Russia); A. A. Voronov, Moscow
Institute of Physics and Technology (Russia)

Room-temperature operation of a Fe²⁺:ZnSe laser [6610-08]
V. A. Akimov, Moscow Institute of Physics and Technology (Russia); M. P. Frolov,
Y. V. Korostelin, V. I. Kozlovsky, A. I. Landman, Y. P. Podmar’kov, Lebedev Physical Institute
(Russia); A. A. Voronov, Moscow Institute of Physics and Technology (Russia)

Combined CW ring single-frequency Ti:sapphire/dye laser for atom cooling and high-
precision spectroscopy [6610-09]
S. Kobtsev, Novosibirsk State Univ. (Russia) and Tekhnoscan Joint-Stock Co. (Russia);
V. Baraulya, V. Lunin, Tekhnoscan Joint-Stock Co. (Russia)

Multifunctional lidar for needs of oil-and-gas pipes [6610-10]
S. V. Alimov, Tumentransgas, Ltd. (Russia); S. V. Kascheev, Vavilov State Optical Institute
(Russia); D. V. Kosachev, Tumentransgas, Ltd. (Russia); S. B. Petrov, A. P. Zhevlakov, Vavilov
State Optical Institute (Russia)

Yb-doped fiber laser with tunable FBG [6610-11]
V. A. Akulov, D. M. Afanasiev, S. A. Babin, S. I. Kablukov, Institute of Automation and
Electrometry (Russia); M. A. Rybakov, Inversion Fiber Co., Ltd. (Russia); A. A. Vlasov, Institute
of Automation and Electrometry (Russia)

30W Yb³⁺ pulsed fiber laser with wavelength tuning and its second harmonic generation
[6610-12]
A. A. Krylov, Fiber Optic Research Ctr. (Russia)

Stochastic model of polarization-dependent gain and gain fluctuations in fiber Raman
amplifier with randomly varying birefringence [6610-13]
S. Sergeyev, Waterford Institute of Technology (Ireland); S. Popov, A. T. Friberg, Royal
Institute of Technology (Sweden)

Drastic reduction of heat release in magneto-optical elements: new ways toward a 100 kW
average power Faraday isolator [6610-14]
(Russia)

Experimental study of Faraday isolator for kilowatt-level average powers [6610-15]
A. V. Vovtievich, V. V. Zelenogorsky, E. A. Khazanov, I. B. Mukhin, O. V. Palashov,
A. K. Poteomkin, A. A. Shaykin, A. A. Soloviev, Institute of Applied Physics (Russia)

Spatial filters for multistage laser amplifiers [6610-16]
A. K. Poteomkin, T. Barmashova, A. V. Kirsanov, M. A. Martyanov, E. A. Khazanov,
A. A. Shaykin, Institute of Applied Physics (Russia)
SESSION 3  LASER MATERIALS

66100I  Fluoride-single crystals for lasers of VUV and UV regions of spectrum [6610-17]
V. V. Apollonov, A.M. Prochorov General Physics Institute (Russia); S. P. Chernov, Moscow State Univ. (Russia); T. V. Ouvvarova, A.M. Prochorov General Physics Institute (Russia)

66100J  The study of processes of nonradiative energy transfer between ions Yb³⁺ and Tm³⁺ in aluminosilicate fibers [6610-18]
A. N. Abramov, Mordovia State Univ. (Russia); A. N. Guryanov, Institute of Chemistry of High-Purity Substances (Russia); E. M. Dianov, A. S. Kurkov, Fiber Research Ctr. (Russia); K. N. Nishchev, P. A. Ryabochkina, Mordovia State Univ. (Russia); M. V. Jashkov, Institute of Chemistry of High-Purity Substances (Russia)

66100K  Up-conversion media on basis single crystals BaY₂F₈ for UV and VUV solid state lasers [6610-19]
A. A. Pushkar, T. V. Ouvvarova, A.M. Prochorov General Physics Institute (Russia); V. N. Molchanov, A.V. Shubnikov Institute of Crystallography (Russia)

66100L  Theoretical and experimental study of migration-assisted upconversion in high-concentration erbium doped silica fibers [6610-20]
S. Sergeyev, Waterford Institute of Technology (Ireland); D. Khoptyar, Eberhard Karls Univ. Tübingen (Germany)

66100M  Spectroscopic investigation of sodium titanium orthophosphates wide band red luminescence [6610-21]
O. Chukova, S. Nedilko, R. Boiko, P. Nagornyj, Kyiv National Taras Shevchenko Univ. (Ukraine)

66100N  Thermally induced wavefront distortions in laser ceramics [6610-22]

66100O  Resistance of KGSS 0180 neodymium glass to laser-induced damage under different irradiation conditions [6610-23]
V. S. Sirazetdinov, NIKI OEP (Russia); V. I. Arbuzov, NIITOM, S.I. Vavilov State Optical Institute (Russia); D. I. Dmitriev, NIKI OEP (Russia); K. V. Dukelsky, NIITOM, S.I. Vavilov State Optical Institute (Russia); I. V. Ivanova, NIKI OEP (Russia); S. G. Lunter, NIITOM, S.I. Vavilov State Optical Institute (Russia); V. N. Pasunkin, NIKI OEP (Russia); A. V. Savkin, RFNC VNIIEF (Russia); A. V. Charukhchev, NIKI OEP (Russia); O. A. Sharov, RFNC VNIIEF (Russia)

SESSION 4  NONLINEAR FREQUENCY CONVERSION

66100P  Efficient second-harmonic generation of CW radiation in an external optical cavity using non-linear crystal BIBO [6610-24]
S. Kobtsev, A. Zavyalov, Novosibirsk State Univ. (Russia)

66100Q  Efficient resonant doubler of CW tunable single-frequency radiation with a 1-THz automatic quasi-smooth scan range [6610-25]
S. Kobtsev, Novosibirsk State Univ. (Russia) and Tekhnoscan Joint-Stock Co. (Russia); V. Baraulya, V. Lunin, Tekhnoscan Joint-Stock Co. (Russia)
High effective SHG of femtosecond pulse with ring profile of beam in bulk medium with cubic nonlinear response [6610-26]
V. A. Trofimov, V. V. Trofimov, Lomonosov Moscow State Univ. (Russia)

Picosecond optical parametric oscillator synchronously intracavity pumped by mode-locked Nd:YVO₄ laser [6610-27]
A. Zavadilová, V. Kubeček, Czech Technical Univ. (Czech Republic); J.-C. Diels, Ctr. for High Technology Materials, Univ. of New Mexico (USA)

The spectrum of up-converted broadband radiation in nonlinear optical crystals [6610-28]
V. V. Krishtop, V. G. Efremenko, M. N. Litvinova, A. V. Syuy, V. I. Stroganov, E. V. Tolstov, Far Eastern State Transport Univ. (Russia)

Particularity of optical features of nonlinear barium sodium niobate [6610-29]
S. V. Ivanova, P.N. Lebedev Physical Institute (Russia)

Observation of spontaneously grown domain structure in SBO crystals via nonlinear diffraction [6610-30]
A. S. Aleksandrovsky, A. I. Zaitsev, A. V. Zamkov, L.V. Kirensky Institute of Physics (Russia)

Classification of noncentrosymmetric oxides with RE³⁺ ions applicable for self frequency doubling (SFD) laser crystals [6610-31]
V. V. Atuchin, B. I. Kidyarov, Institute of Semiconductor Physics (Russia); N. L. Tsirkina, Tecrys, Ltd. (Russia)

Self pulsing due to backward second-harmonic generation in engineered PPLN: the role of the induced cubic nonlinearity [6610-32]
M. Conforti, A. Locatelli, C. De Angelis, Univ. di Brescia (Italy); A. Parini, M. Lauritano, G. Bellanca, S. Trillo, Univ. di Ferrara (Italy)

Author Index
Symposium Committees

Conference Honorary Chairs

Zhores I. Alferov, Ioffe Physical-Technical Institute (Russia)
Charles H. Townes, University of California (USA)

Conference Chair

A. A. Mak, Institute for Laser Physics, Vavilov State Optical Institute (Russia)

Advisory Committee

Zhores I. Alferov, Ioffe Physical-Technical Institute (Russia)
P. A. Apanasevich, Stepanov Institute of Physics (Belarus)
V. I. Bespalov, Institute of Applied Physics (Russia)
D. Bimberg, Technical University Berlin (Germany)
W. Bohn, Institute of Technical Physics, German Aerospace Center (Germany)
Yu. N. Denisyuk, Ioffe Physical-Technical Institute (Russia)
T. Fujioka, Tokai University (Japan)
G. Hager, Air Force Research Laboratory (USA)
D. Hall, Edinburgh University (Great Britain)
G. Huber, University of Hamburg (Germany)
Yu. Kivshar, Australian National University (Australia)
P. Mandel, Université Libre de Bruxelles (Belgium)
E. Moses, Lawrence Livermore National Laboratory (USA)
C. R. Phipps, Photonics Associates (USA)
M. S. Soskin, Institute of Physics (Ukraine)
K.-I. Ueda, Institute of Laser Science (Japan)

Organizing Committee Chair

A. A. Mak, Institute for Laser Physics, Vavilov State Optical Institute (Russia)

Organizing Committee Vice-Chairs

O. D. Gavrilov, NP Laser Optics (Russia)
V. Yu. Venediktov, Institute for Laser Physics, Vavilov State Optical Institute (Russia)

Organizing Committee Members

E. I. Akopov, SPIE Russia Chapter (Russia)
V. M. Arpishkin, Rozhdestvensky Optical Society (Russia)
E. I. Makurov, Vavilov State Optical Institute (Russia)
A. D. Starikov, Institute for Complex Testing (Russia)
L. K. Sukhareva, Institute for Laser Physics, Vavilov State Optical Institute (Russia)
Yu. S. Tverjyanovich, St. Petersburg State University (Russia)
V. N. Vassil’yev, St. Petersburg State University of Information Technologies, Mechanics and Optics (Russia)

Program Committee Chair
A. A. Mak, Institute for Laser Physics, Vavilov State Optical Institute (Russia)

Program Committee Vice-Chairs
A. A. Andreev, Institute for Laser Physics, Vavilov State Optical Institute (Russia)
V. Yu. Venediktov, Institute for Laser Physics, Vavilov State Optical Institute (Russia)

Program Committee Secretary
A. A. Mirzaeva, Institute for Laser Physics, Vavilov State Optical Institute (Russia)

American Local Committee Chair
C. R. Phipps, Photonics Associates, (USA)

Asian Local Committee Chair
Ken-ichi Ueda, University of Electro-Communications (Japan)

European Local Committee Chair
W. Bohn, Institute of Technical Physics, German Aerospace Center (Germany)

Program Subcommittee Cochair
G. Huber, University of Hamburg (Germany)
I. A. Shcherbakov, General Physics Institute (Russia)
I. T. Sorokina, Technical University of Vienna (Austria)

Program Subcommittee Members
G. Hollemann, Jenoptik (Germany)
V. A. Orlovich, Stepanov Institute of Physics (Belarus)
J.-P. Pocholle, Thales Research and Technology (France)
V. A. Serebryakov, Institute for Laser Physics, Vavilov State Optical Institute (Russia)
V. I. Ustyugov, Institute for Laser Physics, Vavilov State Optical Institute (Russia)
G. M. Zverev, Polyus Research and Development Institute (Russia)