PROCEEDINGS OF SPIE

[SPIDigitalLibrary.org/conference-proceedings-of-spie](https://spiedigitallibrary.org/conference-proceedings-of-spie)

Front Matter: Volume 7374

, "Front Matter: Volume 7374," Proc. SPIE 7374, Optical Technologies for Telecommunications 2008, 737401 (18 April 2009); doi: 10.1117/12.832021

SPIE.

Event: Optical Technologies for Telecommunications 2008, 2008, Kazan, Russian Federation

PROCEEDINGS OF SPIE

Optical Technologies for Telecommunications 2008

Vladimir A. Andreev

Vladimir A. Burdin

Oleg G. Morozov

Albert H. Sultanov

Editors

25–27 November 2008

Kazan, Russian Federation

Organized by

Kazan State Technical University (Russian Federation)

Povolzhskiy State University of Telecommunications and Informatics (Russian Federation)

Ufa State Aviation Technical University (Russian Federation)

RBIT a Non-Profit Partnership (Russian Federation)

Published by

SPIE

Volume 7374

Proceedings of SPIE, 0277-786X, v. 7374

SPIE is an international society advancing an interdisciplinary approach to the science and application of light.

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:

Author(s), "Title of Paper," in *Optical Technologies for Telecommunications 2008*, edited by Vladimir A. Andreev, Vladimir A. Burdin, Oleg G. Morozov, Albert H. Sultanov, Proceedings of SPIE Vol. 7374 (SPIE, Bellingham, WA, 2009) Article CID Number.

ISSN 0277-786X

ISBN 9780819476500

Published by

SPIE

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445

SPIE.org

Copyright © 2009, 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 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/09/\$18.00.

Printed in the United States of America.

Publication of record for individual papers is online in the SPIE Digital Library.

SPIDigitalLibrary.org

Paper Numbering: Proceedings of SPIE follow an e-First publication model, with papers published first online and then in print and on CD-ROM. Papers are published as they are submitted and meet publication criteria. A unique, consistent, permanent citation identifier (CID) number is assigned to each article at the time of the first publication. Utilization of CIDs allows articles to be fully citable as soon they are published online, and connects the same identifier to all online, print, and electronic versions of the publication. SPIE uses a six-digit CID article numbering system in which:

- The first four digits correspond to the SPIE volume number.
- The last two digits indicate publication order within the volume using a Base 36 numbering system employing both numerals and letters. These two-number sets start with 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B ... 0Z, followed by 10-1Z, 20-2Z, etc.

The CID number appears on each page of the manuscript. The complete citation is used on the first page, and an abbreviated version on subsequent pages. Numbers in the index correspond to the last two digits of the six-digit CID number.

Contents

vii	Conference Committee
ix	Introduction

SESSION 1 OPTICAL TELECOMMUNICATION TECHNOLOGIES AND SYSTEMS

- 7374 02 **Optimization and statistical analysis of 21.4 Gb/s RZ-DPSK WDM non-slope matched transmission** [7374-01]
T. Broderick, S. A. Boscolo, Aston Univ. (United Kingdom); W. Wong, Azea Networks Ltd. (United Kingdom)
- 7374 03 **Bandwidth expansion approach for DWDM deployment in O-band** [7374-02]
O. G. Morozov, T. S. Sadeev, A. A. Talipov, Kazan State Technical Univ. (Russian Federation)
- 7374 04 **Error probability in optical networks under inexact synchronization** [7374-03]
A. H. Sultanov, I. L. Vinogradova, Ufa State Aviation Technical Univ. (Russian Federation)
- 7374 05 **Investigation of cross-phase modulation in multichannel dispersion managed soliton systems** [7374-04]
V. A. Andreev, V. A. Burdin, M. V. Dashkov, K. A. Volkov, Povolzhskiy State Univ. of Telecommunications and Informatics (Russian Federation)

SESSION 2 PASSIVE AND ACTIVE COMPONENTS OF OPTICAL TELECOMMUNICATION

- 7374 06 **Simulation results of few-mode signal propagation over graded multimode optical fibers with periodical slowly varying core diameter** [7374-05]
A. V. Bourdine, Povolzhskiy State Univ. of Telecommunications and Informatics (Russian Federation) and R&D Company CommunicationAutomationMounting Ltd. (Russian Federation)
- 7374 07 **Nonlinear optical switch creation on the base of step change refractive index of nanostructure materials** [7374-06]
A. I. Salikhov, A. H. Sultanov, I. L. Vinogradova, Ufa State Aviation Technical Univ. (Russian Federation)
- 7374 08 **Synthesis of reflective optical multilayer filters** [7374-07]
V. H. Bagmanov, R. V. Kutluyarov, A. H. Sultanov, Ufa State Aviation Technical Univ. (Russian Federation)
- 7374 09 **Recurrent methods of the minimization of optical multilayer structures for fiber-optic communication facilities** [7374-08]
V. H. Bagmanov, S. V. Kostrov, A. H. Sultanov, Ufa State Aviation Technical Univ. (Russian Federation)

- 7374 0A **All-optical microwave filter for ROF WDM systems based on double mode method** [7374-09]
O. G. Morozov, T. S. Sadeev, A. A. Talipov, Kazan State Technical Univ. (Russian Federation)
- 7374 0B **Distributed temperature fiber Bragg grating sensor** [7374-10]
D. L. Aybatov, R. R. Kiyamova, O. G. Morozov, Kazan State Technical Univ. (Russian Federation); E. V. Suhorukova, Kazan Branch of Povolzhskiy State Univ. of Telecommunications and Informatics (Russian Federation)
- 7374 0C **Electromagnetic waves in shielded evanescent waveguide structures with active media** [7374-11]
A. G. Glushchenko, E. P. Zakharchenko, Povolzhskiy State Univ. of Telecommunications and Informatics (Russian Federation)
- 7374 0D **Propagation of electromagnetic waves in the waveguides through evanescent sections with active media** [7374-12]
A. G. Glushchenko, E. P. Zakharchenko, Povolzhskiy State Univ. of Telecommunications and Informatics (Russian Federation)

SESSION 4 ONE-DIMENSION AND MULTIDIMENSION OPTICAL SIGNALS DATA PROCESSING

- 7374 0E **Textures, fractal, scaling effects, and fractional operators as a basis of new methods for data processing and fractal radio system design** [7374-13]
A. A. Potapov, Institute of Radio-engineering and Electronics (Russian Federation)
- 7374 0F **Reconstruction of satellite images based on fractal filters** [7374-14]
V. H. Bagmanov, S. V. Kharitonov, I. K. Meshkov, A. H. Sultanov, Ufa State Aviation Technical Univ. (Russian Federation)
- 7374 0G **Wavelet multiscale processing of remote sensing data** [7374-15]
V. H. Bagmanov, S. V. Kharitonov, I. K. Meshkov, A. H. Sultanov, Ufa State Aviation Technical Univ. (Russian Federation)
- 7374 0H **Nonlinear processing of signals on the basis of model in the form of generalized nonlinear Schrodinger equation** [7374-16]
I. V. Grigorov, Povolzhskiy State Univ. of Telecommunications and Informatics (Russian Federation)

SESSION 5 OPTICAL NETWORKS MAINTENANCE, CONTROL, AND RESTORATION

- 7374 0I **Investigation of the optical buffer tube deformation influence on fiber attenuation property loss** [7374-17]
V. A. Andreev, V. A. Burdin, S. A. Gavryushin, T. G. Nikulina, Povolzhskiy State Univ. of Telecommunications and Informatics (Russian Federation)
- 7374 0J **Results of conventional field-test equipment application for identification of multimode optical fibers with high DMD** [7374-18]
A. V. Bourdine, Povolzhskiy State Univ. of Telecommunications and Informatics (Russian Federation) and R&D Company CommunicationAutomationMounting Ltd. (Russian Federation); E. V. Dmitriev, D. E. Praporshchikov, V. I. Prokopyev, K. A. Yablochkin, Povolzhskiy State Univ. of Telecommunications and Informatics (Russian Federation)

- 7374 0K **Choice of method for optical closure sealing under extreme conditions of operation** [7374-19]
I. N. Alekhin, Povolzhskiy State Univ. of Telecommunications and Informatics
(Russian Federation)
- 7374 0L **Reflectometer with linear frequency modulated subcarrier** [7374-20]
L. R. Aybatov, Kazan State Technical Univ. (Russian Federation)

Author Index

Conference Committee

Conference Chairs

Vladimir A. Andreev, Povolzhskaya State Academy of Telecommunications and Informatics (Russian Federation)
Vladimir A. Burdin, Povolzhskaya State Academy of Telecommunications and Informatics (Russian Federation)
Oleg G. Morozov, Kazan State Technical University (Russian Federation)
Albert H. Sultanov, Ufa State Aviation Technical University (Russian Federation)

Program Committee

A. L. Abdullin, ANRT (Russian Federation)
R. A. Badamshin, Ufa State Aviation Technical University (Russian Federation)
A. L. Buzov, Samara Radio Research and Development Institute (Russian Federation)
Sh. M. Chabdarov, Kazan State Technical University (Russian Federation)
V. A. Gorbunov, Kazan State Technical University (Russian Federation)
V. N. Gordienko, Moscow Technical University of Communications and Informatics (Russian Federation)
Yu. F. Gortyshov, Kazan State Technical University (Russian Federation)
M. B. Guzairov, Ufa State Aviation Technical University (Russian Federation)
G. I. Ilin, Kazan State Technical University (Russian Federation)
A. S. Hamzin, Institute of Physics RAS (Russian Federation)
O. N. Maslov, Povolzhskaya State Academy of Telecommunications and Informatics (Russian Federation)
S. A. Mihajlov, Kazan State Technical University (Russian Federation)
A. F. Nadeev, Kazan State Technical University (Russian Federation)
G. I. Sherbakov, Kazan State Technical University (Russian Federation)
L. N. Shafigullin, TatTelecom (Russian Federation)
V. M. Tanov, BB SPb SUT (Russian Federation)
Y. B. Zubarev, MNIIT (Russian Federation)

Introduction

This volume contains a selection of papers presented at the eighth International Conference on Optical Technologies for Telecommunications. The conference was held at Kazan State Technical University in Kazan, Russia, 25–27 November 2008.

The conference was held during the remarkable year of the 100th birthday anniversary of the academician Vladimir A. Kotelnikov, a famous Russian scientist and native of Kazan. Kotelnikov founded the theoretical basis and provided great advantages in the development of radiotechnics and telecommunications. Both the scientific and practical merits of Kotelnikov's have received public acknowledgments in different countries. In 2003, Vladimir A. Kotelnikov was named "the most famous radio-engineer all over the world" during the solemn ceremony of Bell's Honor Award.

The conference covered a large range of problems in optical technologies in telecommunications. The papers accepted for publication in this volume were chosen from papers presented at the conference on the topics listed in the table of contents.

We have no doubt that the proceedings of this conference will be helpful for both scientists and specialists working in the fields of telecommunication technologies.

**Vladimir A. Andreev
Vladimir A. Burdin
Oleg G. Morozov
Albert H. Sultanov**