TU Delft

Delft University of Technology

Document Version
Final published version

Citation (APA)
De Bont, M., Knop, T., Fredriksson, I., Steenbergen, W., Bhattacharya, N., & Chizari, A. (2026). Methodology for enhanced optical signal acquisition in wearable cardiovascular monitoring: initial findings. In V. V. Tuchin, M. J. Leahy, & R. K. Wang (Eds.), *Dynamics and Fluctuations in Biomedical Photonics XXIII* Article 138500G (Proceedings of SPIE - The International Society for Optical Engineering; Vol. 13850). SPIE. https://doi.org/10.1117/12.3089603

Important note
To cite this publication, please use the final published version (if applicable).
Please check the document version above.

Copyright
In case the licence states “Dutch Copyright Act (Article 25fa)”, this publication was made available Green Open Access via the TU Delft Institutional Repository pursuant to Dutch Copyright Act (Article 25fa, the Taverne amendment). This provision does not affect copyright ownership.
Unless copyright is transferred by contract or statute, it remains with the copyright holder.

Sharing and reuse
Other than for strictly personal use, it is not permitted to download, forward or distribute the text or part of it, without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license such as Creative Commons.

Takedown policy
Please contact us and provide details if you believe this document breaches copyrights.
We will remove access to the work immediately and investigate your claim.

This work is downloaded from Delft University of Technology.

PROGRESS IN BIOMEDICAL OPTICS AND IMAGING
Vol. 27 No. 28

Dynamics and Fluctuations in Biomedical Photonics XXIII

Valery V. Tuchin
Martin J. Leahy
Ruikang K. Wang
Editors

17–19 January 2026
San Francisco, California, United States

Sponsored and Published by
SPIE

Volume 13850

Proceedings of SPIE, 1605-7422, V. 13850

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

Dynamics and Fluctuations in Biomedical Photonics XXIII, edited by Valery V. Tuchin, Martin J. Leahy, Ruikang K. Wang, Proc. of SPIE Vol. 13850, 1385001
2026 Published by SPIE · 1605-7422 · doi: 10.1117/12.3115317

The papers 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. Additional papers and presentation recordings may be available online in the SPIE Digital Library at SPIEDigitalLibrary.org.

The papers 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 these proceedings:
Author(s), "Title of Paper," in *Dynamics and Fluctuations in Biomedical Photonics XXIII*, edited by Valery V. Tuchin, Martin J. Leahy, Ruikang K. Wang, Proc. of SPIE 13850, Seven-digit Article CID Number (DD/MM/YYYY); (DOI URL).

ISSN: 0277-786X
ISSN: 1996-756X (electronic)

ISBN: 9781510696136
ISBN: 9781510696143 (electronic)

Published by
SPIE
P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone +1 360 676 3290 (Pacific Time)
SPIE.org
Copyright © 2026 Society of Photo-Optical Instrumentation Engineers (SPIE).

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 fees. To obtain permission to use and share articles in this volume, visit Copyright Clearance Center 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.

Printed in the United States of America by Curran Associates, Inc., under license from SPIE.

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

SPIE. DIGITAL LIBRARY
SPIEDigitalLibrary.org

Paper Numbering: A unique citation identifier (CID) number is assigned to each article in the Proceedings of SPIE at the time of publication. Utilization of CIDs allows articles to be fully citable as soon as they are published online, and connects the same identifier to all online and print versions of the publication. SPIE uses a seven-digit CID article numbering system structured as follows:

- The first five 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.

Contents

v *Conference Committee*

SPECKLE DYNAMICS AND FLUCTUATIONS IN SPECTROSCOPY AND IMAGING I

13850 02 **Photoplethysmographic pulse decomposition analysis for stiffness differentiation in microfluidic phantoms** [13850-2]

13850 03 **Real-time monitoring of dynamic reflectance using a compact multispectral imaging and machine learning system** [13850-5]

SPECKLE DYNAMICS AND FLUCTUATIONS IN SPECTROSCOPY AND IMAGING II

13850 04 **Hilbert-initialized hybrid phase retrieval for optical vortex analysis in speckle imaging (Invited Paper)** [13850-6]

13850 05 **Real-time choroidal blood perfusion imaging using laser speckle flowgraphy with eigendecomposition** [13850-8]

OPTICAL COHERENCE TOMOGRAPHY I

13850 06 **High-speed multicontrast dynamic OCT by using deep learning** [13850-10]

13850 07 **Noninvasive mechanical profiling of breast cancer cells-laden 3D hydrogels using dynamic optical coherence tomography** [13850-12]

OPTICAL COHERENCE TOMOGRAPHY II

13850 08 **Tartrazine-based optical clearing to enable deep imaging of murine embryos with optical coherence tomography (Invited Paper)** [13850-15]

13850 09 **In vivo birefringence mapping of human gingiva using polarization-sensitive OCT** [13850-18]

CEREBRAL DYNAMICS I

13850 0A **Monitoring cerebral dynamics using sweeping nonlinear coherent hemodynamics spectroscopy model** [13850-20]

13850 0B **Noninvasive sensing of intracranial water in cerebrospinal fluid and blood by near-infrared spectroscopy (Invited Paper)** [13850-21]

CEREBRAL DYNAMICS II

13850 0C **Applying new dynamic models to near-infrared spectroscopy measurements of cerebral changes (Invited Paper)** [13850-23]

TISSUE OPTICAL PROPERTIES, CONTROLLING, AND MODELING I

13850 0D **High-fidelity 3D Monte Carlo modeling of melanoma-affected skin: addressing variability in optical properties using machine learning (Invited Paper)** [13850-26]

13850 0E **Controlled tissue restoration by laser creating microdefects (Invited Paper)** [13850-27]

13850 0F **Lactate levels show a consistent pattern when using a correlation heat map for the wavelength ratio between 1000-1100 nm and 640-680 nm** [13850-31]

TISSUE OPTICAL PROPERTIES, CONTROLLING, AND MODELING II

13850 0G **Methodology for enhanced optical signal acquisition in wearable cardiovascular monitoring: initial findings** [13850-32]

POSTER SESSION

13850 0H **Low-frequency modulation enhances sensitivity when using acousto-optic technique for monitoring focused ultrasound tissue effects** [13850-33]

13850 0I **Achieving optical transparency in human skin with absorbing molecules** [13850-36]

13850 0J **Biomedical applications of two-foci cross-correlation technique in massively parallel fluorescence correlation spectroscopy** [13850-40]

Conference Committee

Symposium Chairs

Rainer A. Leitgeb, Medizinische Universität Wien (Austria)
Laura Marcu, University of California, Davis (United States)

Symposium Co-chairs

Sergio Fantini, Tufts University (United States)
Paola Taroni, Politecnico di Milano (Italy)

Program Track Chairs

E. Duco Jansen, Vanderbilt University (United States)
Jessica C. Ramella-Roman, Florida International University (United States)

Conference Chairs

Valery V. Tuchin, Saratov State University (Russian Federation), Tomsk State University (Russian Federation) and Institute of Precision Mechanics and Control of the RAS (Russian Federation)
Martin J. Leahy, University of Galway (Ireland)
Ruikang K. Wang, University of Washington (United States)

Conference Program Committee

Walter C.P.M. Blondel, Université de Lorraine (France)
Wei R. Chen, The University of Oklahoma (United States)
Joseph P. Culver, Washington University School of Medicine in St. Louis (United States)
Alexander Doronin, Victoria University of Wellington (New Zealand)
Turgut Durduran, ICFO - Institut de Ciències Fotòniques (Spain)
Ling Fu, Hainan University (China)
Ekaterina I. Galanzha, University of Arkansas for Medical Sciences (United States)
Michael W. Jenkins, Case Western Reserve University (United States)
Jana M. Kainerstorfer, Carnegie Mellon University (United States)
Brendan F. Kennedy, Harry Perkins Institute of Medical Research (Australia)
Sean J. Kirkpatrick, Michigan Technological University (United States)
Kirill V. Larin, University of Houston (United States)
Irina V. Larina, Baylor College of Medicine (United States)
Peng Li, Zhejiang University (China)

Qian Liu, Hainan University (China)
Zhenhe Ma, Northeastern University at Qinhuangdao (China)
Teemu S. Myllylä, University of Oulu (Finland)
Andrew M. Rollins, Case Western Reserve University (United States)
Inga Saknite, Vanderbilt University Medical Center (United States) and University of Latvia (Latvia)
Evgeny A. Shirshin, M. V. Lomonosov Moscow State University (Russian Federation)
Melissa C. Skala, Morgridge Institute for Research (United States)
Vladislav Toronov, Toronto Metropolitan University (Canada)
Anna N. Yaroslavsky, University of Massachusetts Lowell (United States)
Yoshiaki Yasuno, University of Tsukuba (Japan)
Zeev Zalevsky, Bar-Ilan University (Israel)
Azhar Zam, New York University Abu Dhabi (United Arab Emirates)
Chao Zhou, Washington University in St. Louis (United States)
Dan Zhu, Huazhong University of Science and Technology (China)