PROCEEDINGS OF SPIE

Speckle 2010: Optical Metrology

Armando Albertazzi Gonçalves, Jr.
Guillermo H. Kaufmann
Editors

13–15 September 2010
Florianópolis, Brazil

Organized by
Universidade Federal de Santa Catarina—Labmetro (Brazil)

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Society for Experimental Mechanics (United States)
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Published by
SPIE

Volume 7387

Proceedings of SPIE, 0277-786X, v. 7387

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Please use the following format to cite material from this book:
Author(s), "Title of Paper," in *Speckle 2010: Optical Metrology*, edited by Armando Albertazzi Gonçalves, Jr., Guillermo H. Kaufmann, Proceedings of SPIE Vol. 7387 (SPIE, Bellingham, WA, 2010) Article CID Number.

ISSN 0277-786X
ISBN 9780819476708

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

Printed in the United States of America.

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

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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:

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Introduction

The invention of laser has allowed sources of light with a high degree of coherence, and seeing a new effect with a grainy aspect, which appeared when optically rough surfaces were illuminated with a laser light. After the advent of laser sources, this effect, called *speckle*, was considered a mere nuisance mainly for holography techniques. However, important research efforts began in the late 60s and early 70s, focusing on the development of new methods for performing high sensitivity measurements on diffusely reflecting surfaces. Nowadays, speckle metrology is a very rich and growing area, widely used in science and industry.

This volume contains the papers presented during the Speckle 2010, held in Florianópolis, September 13–15, 2010. This successful international conference started in 2000 in Lausanne, Switzerland, then it was held in Trondheim, Norway in 2003 and, finally, it was organized in Nîmes, France in 2006. This is the first time that the "Speckle" leaves Europe and is held in South America, more precisely in Florianópolis, Brazil.

Contributions from 72 papers from all over the world discuss the most recent theories, techniques, and data analysis approaches, as well as the state-of-the-art of different applications of the speckle effect in experimental mechanics, material science, optical testing, and developing of sensor systems.

Papers presented in this event can be grouped in eleven topics:

- Speckle as a tool in security techniques.
- Fringe analysis and data analysis techniques in speckle metrology/Phase evaluation and unwrapping.
- Digital speckle pattern interferometry.
- Nondestructive testing/Material characterization and damage detection/ Shearography.
- Micro-measurements and industrial applications.
- Conventional and digital holography/ Holographic interferometry.
- Speckles, theory and fundamentals/Speckle vortices.
- Speckle photography and digital image correlation.
- Low coherence and white speckle interferometry.
- Dynamic speckle.

- Biomedical research and speckle noise reduction.

The editors would like to express their thanks to all the authors who spent a lot of time and efforts in the preparation of their papers, which were decisive for the success of the conference, to the audience for their growing interest in speckle applications and to all sponsors that made possible this event. Finally, our appreciation goes to SPIE for the publication of the proceedings.

Florianópolis, September 2010

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Guillermo H. Kaufmann