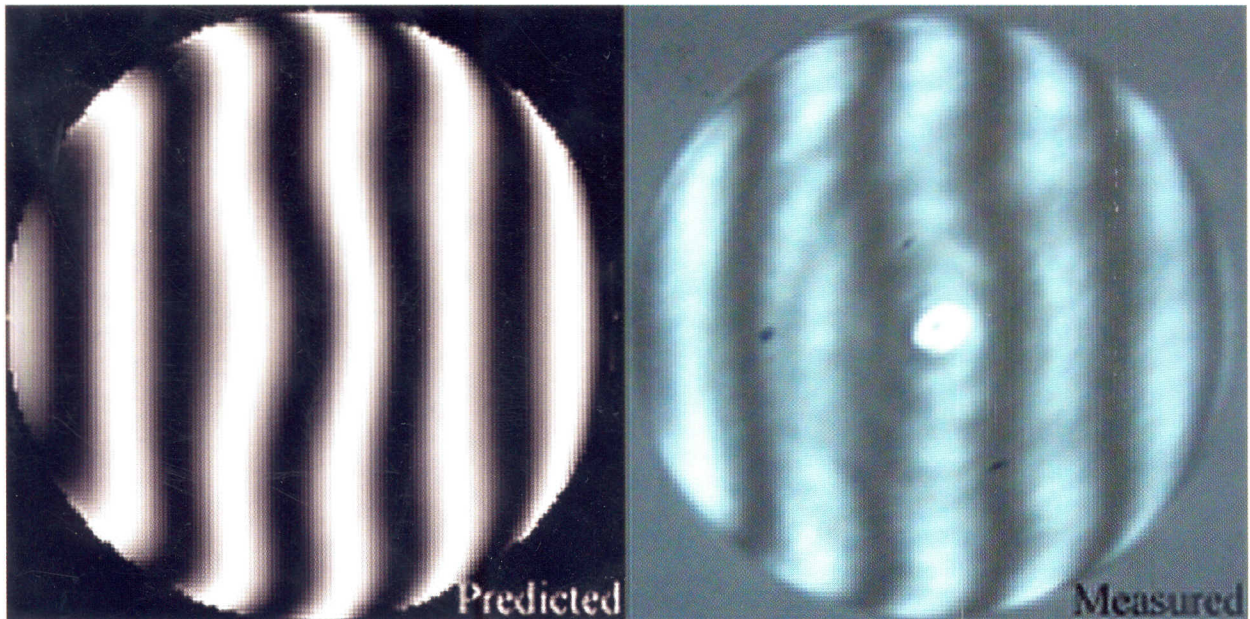


Applied Optics



Applied Optics

Volume 50
Number 26
10 September 2011

www.osa.org

Information Pages

Feature Calendar	vi
Information for Contributors	xi

Cover

MSL MARDI lens: the close match between predicted and measured interferograms of the system's wavefront indicates that achieving high accuracy alignment of elements in a multi-element lens maximizes its performance extremely close to design predictions. For details see the paper by Ghaemi, pp. 5108–5114.

OPTICAL TECHNOLOGY

Detectors

Stray light correction for diode-array-based spectrometers using a monochromator	Saber G. R. Salim, Nigel P. Fox, William S. Hartree, Emma R. Woolliams, Tong Sun, and Kenneth T. V. Grattan	5130
--	---	------

Diffraction and Gratings

Diffractional incremental and absolute coding principle for optical rotary sensors	David Hopp, Christof Pruss, Wolfgang Osten, Jonathan Seybold, Karl-Peter Fritz, Tim Botzelmann, Volker Mayer, and Heinz Kück	5169
--	--	------

Fiber Optics and Optical Communications

Composite cavity fiber laser sensors based on weak feedback	Jianzhong Zhang, Quan Chai, Qianqian Hao, Yubin Ge, Xingliang Li, Qi Li, Weimin Sun, Libo Yuan, and Gangding Peng	5059
---	---	------

Geometric Optics

Alternative method for measuring effective focal length of lenses using the front and back surface reflections from a reference plate	Do-Hyun Kim, Dexiu Shi, and Ilko K. Ilev	5163
Ray-tracing method for isotropic inhomogeneous refractive-index media from arbitrary discrete input	Yohei Nishidate, Takashi Nagata, Shin-ya Morita, and Yutaka Yamagata	5192

Imaging Systems

Application of generalized grating imaging to pattern projection in three-dimensional profilometry	Koichi Iwata, Yusuke Sando, Kazuo Satoh, and Kousuke Moriwaki	5115
--	---	------

Instrumentation, Measurement, and Metrology

Blood oxygenation measurements by multichannel reflectometry on the venous and arterial structures of the retina	Valentina Vucea, Pierre-Jean Bernard, Patrick Sauvageau, and Vasile Diaconu	5185
--	---	------

Integrated Optics

Polarizability, volume expansion, and stress contributions to the refractive index change of Cu^+ - Na^+ ion exchanged waveguides in glass

Robert Oven

5073

Optical Design and Fabrication

Ultra-high-precision alignment of the elastomerically mounted elements of the science camera lenses for the Mars Science Laboratory (MSL) rover

F. Tony Ghaemi

5108

Spectroscopy

Application of miniature spectrometer in liquid signature analysis technology

Haixiu Chen and Huiqiang Tang

5093

INFORMATION PROCESSING

Instrumentation, Measurement, and Metrology

Projection-aided videometric method for shape measurement of large-scale bulk material stockpile

Xiaohu Zhang, Jianliang Ou, Yun Yuan, Yang Shang, and Qifeng Yu

5178

Machine Vision

Pinhole detection in steel slab images using Gabor filter and morphological features

Doo-chul Choi, Yong-ju Jeon, Jong Pil Yun, and Sang Woo Kim

5122

LASERS, PHOTONICS, AND ENVIRONMENTAL OPTICS

Atmospheric and Oceanic Optics

Measurements of laser phase fluctuations induced by atmospheric turbulence over 2 km and 17.5 km distances

Kevin D. Ridley

5085

Mueller matrix measurements of algae with different shape and size distributions

Øyvind Svensen, Jakob J. Stamnes, Morten Kildemo, Lars Martin Sandvik Aas, Svein Rune Erga, and Øyvind Frette

5149

Coherence and Statistical Optics

Pointing efficiency in Gaussian beam coherent ladar

Scott Shald and Philip Gatt

5200

Diffraction and Gratings

Ultrasensitive guided-mode resonance biosensors superimposed with vertical-sidewall roughness

Chih-Sheng Jao and Hoang Yan Lin

5139

Officers of the Society

J. CHRISTOPHER DAINTY,
President
National University of Ireland,
Galway

TONY F. HEINZ,
President-Elect
Columbia University

DONNA T. STRICKLAND,
Vice President
University of Waterloo

JAMES C. WYANT,
Past President
University of Arizona

STEPHEN D. FANTONE,
Treasurer
Optikos Corporation

ELIZABETH ROGAN,
CEO

OSA Staff

Christopher Videll
Associate Director, Production &
Technology

Joseph Richardson
Feature Proposals Manager

Antoinette P. Wrighton
Director of Editorial Services

M. Scott Dineen
Deputy Senior Director,
Publications

Kelly Cohen
Publisher

Daniel Dawes
Production Editor

Stu Griffith
Publications Senior Production
Manager

Carlos X. Izurieta
Production Assistant

Chastee Lim
Journals Assistant

Ruth Serinas
Journals Assistant

Peer Review

Carmelita Washington
Applied Optics Coordinator

Keith Jackson
Journal Assistant

Rights and Permissions

Hannah Bembia
Copyright Permission Requests

Elizabeth Nolan
Chief Publishing Officer

Instrumentation, Measurement, and Metrology

Improving the measurement performance for a self-mixing interferometry-based displacement sensing system

Yuanlong Fan, Yanguang Yu,
Jiangtao Xi, and Joe F. Chicharo

5064

Femtosecond laser electronic excitation tagging for quantitative velocity imaging in air

James B. Michael,
Matthew R. Edwards,
Arthur Dogariu, and
Richard B. Miles

5158

Lasers and Laser Optics

Quasi synchronous tuning for grating feedback lasers

Erjun Zang, Shaokai Wang,
Yang Zhao, Yu Peng, Tao Yang,
Ye Li, Jianping Cao, Tianchu Li,
and Zhanjun Fang

5080

Experimental and theoretical study of a laser-diode-pumped passively Q-switched intracavity-frequency-doubled Nd:GdVO₄/KTP red laser with V:YAG saturable absorber

Chao Xu, Guiqiu Li, Shengzhi Zhao,
Xin Li, Guolong Du, and Lei Yin

5099

Copyright © 2011, Optical Society of America. Copying of material in this journal is subject to payment of copying fees. The code that appears on the first page of each article in this journal gives the per-article copying fee for each copy of the article made beyond the free copying permitted under Sections 107 and 108 of the U.S. Copyright Law. This fee should be paid through the Copyright Clearance Center, Inc., 222 Rosewood Drive, Danvers, Mass. 01923. The same fees and procedures apply to articles published in previous volumes of this journal. Permission is granted to quote excerpts from articles in this journal in scientific works with the customary acknowledgment of the source, including the author's name and the journal name, volume, page, and year. Reproduction of figures and tables is likewise permitted in other articles and books, provided that the same information is printed with them, permission of one of the original authors is obtained, and notification is given to the Optical Society of America. Reproduction or systematic or multiple reproduction of any material (including electronic publication or reproduction) in this journal (including abstracts) is permitted only under license from the Optical Society of America; in addition, the Optical Society may require that permission also be obtained from one of the authors. Address inquiries and notices to the Director of Publications, Optical Society of America, 2010 Massachusetts Avenue, NW, Washington, DC 20036-1023. In the case of articles whose authors are employees of the United States Government or its contractors or grantees, the Optical Society of America recognizes the right of the United States Government to retain a nonexclusive, royalty-free license to use the author's copyrighted article for United States Government purposes. *Applied Optics* (ISSN 0003-6935) is published three times a month by the Optical Society of America, 2010 Massachusetts Avenue, NW, Washington, DC 20036-1023. CODEN:AOPAL. USPS Publication No. 879520. 2011 subscription rates (domestic) per year (print plus online); \$265.00 for OSA members; nonmember and library subscriptions: \$4842.00. Periodicals postage paid at Washington, DC 20066-9998 and at additional mailing offices. POSTMASTER: Send address changes to *Applied Optics*, 2010 Massachusetts Avenue, NW, Washington, DC 20036-1023. **Subscriptions, missing copies, and change of address:** Optical Society of America, Fulfillment Services, 2010 Massachusetts Avenue, NW, Washington, DC 20036-1023; (202) 416-1907; FAX (202) 416-6130. Back number, single-issue, and foreign rates available on request. *Applied Optics*® is a registered trademark of OSA.