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978-0-521-86102-1 - Fiber Optical Parametric Amplifiers, Oscillators and Related Devices

Michel E. Marhic

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Fiber Optical Parametric Amplifiers, Oscillators and Related Devices

Fiber optical parametric amplifiers (OPAs) show great potential for applications in high-speed optical communication systems. This is the first book to provide comprehensive coverage of the theory and practice of OPAs and related devices, including fiber optical parametric oscillators (OPOs).

Following an introduction to the field, the theory and techniques behind all types of fiber OPA are covered, starting from first principles. Topics include scalar and vector OPA theory, the nonlinear Schrödinger equation, OPO theory, and the quantum noise figure of fiber OPAs. The challenges of making fiber OPAs practical for a number of applications are discussed, and a survey of the state of the art in feasibility demonstrations and performance evaluations is provided. The capabilities and limitations of OPAs are presented, as are the potential applications for both OPAs and OPOs and the prospects for future developments in the field. The theoretical tools developed in this text can also be applied to other areas of nonlinear optics.

This book should provide a valuable resource for researchers, advanced practitioners, and graduate students in optoelectronics.

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CAMBRIDGE UNIVERSITY PRESS

Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore, São Paulo

Cambridge University Press

The Edinburgh Building, Cambridge CB2 8RU, UK

Published in the United States of America by Cambridge University Press, New York

www.cambridge.org

Information on this title: www.cambridge.org/9780521861021

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First published 2008

Printed in the United Kingdom at the University Press, Cambridge

A catalog record for this publication is available from the British Library

ISBN 978-0-521-86102-1 hardback

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Acknowledgments

Thanks are due to K. K.-Y. Wong, J. Nielsen, M. Jamshidifar and P. Voss for proofreading parts of the manuscript. I would also like to thank G. Kalogerakis, J. M. Chavez Boggio, T. Torounidis, K. K.-Y. Wong, and P. Voss for providing some of the figures.