Series on Advances in Mathematics for Applied Sciences – Vol. 26

Recent Advances in Elasticity, Viscoelasticity and Inelasticity

Festschrift Volume for Prof. Tse-Chien Woo on the Occasion of his Seventieth Birthday

Editor

K. R. Rajagopal

University of Pittsburgh
USA

World Scientific
Singapore • New Jersey • London • Hong Kong

Published by

World Scientific Publishing Co. Pte. Ltd.

P O Box 128, Farrer Road, Singapore 9128

USA office: Suite 1B, 1060 Main Street, River Edge, NJ 07661

UK office: 57 Shelton Street, Covent Garden, London WC2H 9HE

Library of Congress Cataloging-in-Publication Data

Recent advances in elasticity, viscoelasticity, and inelasticity :
Festschrift volume in honor of Prof. Tse-Chien Woo on the occasion of his 70th birthday / edited by K. R. Rajagopal.
p. cm. -- (Series on advances in mathematics for applied sciences, vol. 26)
ISBN 9810221037
I. Elasticity -- Mathematical models. 2. Viscoelasticity -- Mathematical models. I. Woo, Tse-Chien. II. Rajagopal, K. R. (Kumbakonam Ramamani) III. Series.
TA418.R43 1995
620.1'1232--dc20 94-23839
CIP

Copyright © 1995 by World Scientific Publishing Co. Pte. Ltd.

All rights reserved. This book, or parts thereof, may not be reproduced in any form or by any means, electronic or mechanical, including photocopying, recording or any information storage and retrieval system now known or to be invented, without written permission from the Publisher.

For photocopying of material in this volume, please pay a copying fee through the Copyright Clearance Center, Inc., 27 Congress Street, Salem, MA 01970, USA.

Printed in Singapore by Uto-Print

Table of Contents

Preface v

Energy Flux and Dissipation in Linear Dissipative Systems 1
Ph. Boulanger and M. Hayes

A Constitutive Equation for the Aging of Elastomers 7
W. W. Feng

Rate and Gradient Effects in a Theory of Solid-Solid Phase Transitions 17
E. Fried and G. Grach

Large Deformations of Infinite Cylinders in the Context of Thermoelasticity 35
C. E. Maneschy

Convection in Third Grade Fluids 47
M. Massoudi and I. Christie

Disarrangements in Continua and the Geometry of Microstructure 67
D. R. Owen

Convolutions as Products in Viscoelasticity Theory 82
A. C. Pipkin

On the Use of a Work Inequality in Rate Independent Plasticity 108
A. R. Srinivasa

On Boundary Conditions in Mixture Theory . . . 130
L. Tao and K. R. Rajagopal

Antiplane Deformations of Anisotropic Elastic Materials 150
T. C. T. Ting

Response of Beams of Viscoelastic Materials with a Strain Clock 180
A. Wineman and R. Kolberg

Development of a Viscoelastoplastic Constitutive Model for Commercial-Purity Aluminum 210
E. F. M. Winter

Normal Stress Gradients in Corrugated Channels 228
R. C. Yalamanchili