

Table of Contents

Preface

Chapter 1

An Introduction to Micromechanics

W. Yu

3

Chapter 2

Optimisation of Variable Stiffness Plates

P.M. Weaver, Z.M. Wu and G. Raju

27

Chapter 3

Selected Aspects of Current Challenges in Composite Product Development for Automotive and Aerospace Industry

S. Czichon, J. Köhnke, A. Preisler and H. Herranen

51

Chapter 4

Fatigue Properties of Aerospace Z-Pinned Composites

A.P. Mouritz, F. Pegorin, M.D. Isa and K. Pingkarawat

67

Chapter 5

Some Examples of “Multi-Physical” Fatigue of Organic Matrix Composites for Aircraft Applications

M. Gigliotti, Y. Pannier, M.C. Lafarie-Frenot and J.C. Grandidier

79

Chapter 6

Post-Buckling Analysis of Damaged Multilayered Composite Stiffened Plates by Rayleigh-Ritz Method

V. Oliveri, A. Alaimo and A. Milazzo

99

Chapter 7

A Promising Way to Model Damage in Composite and Dry Fabrics Using a Discrete Element Method (DEM)

F. Dau, J. Girardot and B.D. Le

119

Chapter 8

A Thermal Stress Analysis of Three-Dimensional Beams by Refined One-Dimensional Models and Strong Form Solutions

G. Giunta, S. Belouettar and E. Carrera

139

Chapter 9

High-Fidelity and Computationally Efficient Component-Wise Structural Models: An Overview of Applications and Perspectives

M. Petrolo and E. Carrera

175

Chapter 10

Reduced Order Models for Static and Dynamic Analysis of Composite Panels Based on a Perturbation Approach

E. Jansen, T. Rahman and R. Rolfes

199

Chapter 11

Shell Finite Elements for the Analysis of Multifield Problems in Multilayered Composite Structures

M. Cinefra and E. Carrera

215