

Prof. Dr.-Ing. Ulrich Gabbert (Hrsg.), Magdeburg

Smart Mechanical Systems - Adaptronics

Reihe **11** : Schwingungstechnik

Nr. **244**

Content

SMART MATERIAL SYSTEMS AND ACTUATORS

H. Hanselka

Realization of Smart Structures by Using Fiber Composite Materials 1

M. Kuna

Numerical Analysis of Electromechanically Loaded Defects in Smart Ceramic Materials 11

G. Mook, J. Pohl, F. Michel, P. Veit

Non-Destructive Evaluation of Adaptive Material Systems 23

S. Seelecke

Control of Beam Structures by Shape Memory Wires 33

FINITE ELEMENT ANALYSIS OF SMART MECHANICAL SYSTEMS

H. S. Tzou

Photodeformation Based Distributed Opto-electromechanical Shell Actuators - Modelling and Analysis 43

J. Chroscielewski, P. Klosowski, R. Schmidt

Modelling and FE Analysis of Large Deflection Shape and Vibration Control of Structures via Piezoelectric Layers 53

G.I. Lvov, V.V. Ovcharenko

Finite Element Analysis for the Vibration of a Laminated Composite Shell with the Use of Piezoelectric Materials 63

OPTIMIZATION OF ACTUATOR AND SENSOR DISTRIBUTION

J. C. Bruch, Jr., J. Sloss, S. Adali, J.S. Sadek

Optimal Piezoelastic Actuator Location for Minmax Static Deflection of Laminated Beams 73

U. Gabbert, I. Schulz, Ch.-T. Weber

Actuator Placement in Smart Structures by Discrete-Continuous Optimization 83

H. Irschik, K. Hagenauer, F. Ziegler

An Exact Solution for Structural Shape Control by Piezoelectric Actuation . . . 93

V.D. Koshur

Combination of Numerical Models and Neural Networks for Solutions of Optimizations Problems and Control 99

MODELLING OF ACTUATORS AND ACTIVE DAMPING

G. Tomlinson	
Passive and Active Damping Procedures	105
B. Clephas, H. Janocha	
Mathematische Methoden zur Berechnung und Simulation von adaptiven Systemen	117
T. Theis, R. Kasper	
Ein flexibles Ansteuerkonzept für piezoelektrische Stellsysteme	127

CONTROL OF SMART STRUCTURES

W. Schiehlen, H. Schönerstedt	
Reglerentwurf zur aktiven Schwingungsdämpfung von Balkenstrukturen ..	137
K. Ma, J. Melcher	
Real Time Simulation of Adaptive Vibration Control for Smart Rotor	147
Ch. Döschner, M. Enzmann	
On Model Based Controller Design for Smart Structures	157
P. M. Przybylowicz	
Actuators Inertia Effect on the Bang-Bang Piezocontrol Strategy toward Torsional Vibration	167

APPLICATIONS AND EXPERIMENTAL RESULTS

F. Döngi, H. Baier, U. Johann	
Adaptive Structures for Future Interferometric Missions in Space	175
J. Schröder	
Piezo-Stellantrieb für adaptive mechanische Strukturen	185
F. Laugwitz	
Experimental Results on Active Damping of Beams by Piezoelectric Linear Actuator	195
S. Adali, J.C. Bruch, Jr., J.M. Sloss, I.S. Sadek	
Optimum Actuator Locations for the Control of Vibrating Beams	205
Ch. Linz, L. Sperling, F. Wahl	
Experimentelle Untersuchungen zur aktiven Schwingungsdämpfung elastischer Strukturen mit Hilfe diskreter Modalfilter	215
A. Tylikowski	
Active Flutter Suppression of a Panel Using a Distributed Control	225

T. Lilienblum, W. Zhang, B. Michaelis
**Sensor Data Compression for Smart Mechanical Systems by Artificial
Neural Networks** 235

**Report on Panel Discussion:
Prospects of the Smart Structures Technology** 245