

STRUCTURAL HEALTH MONITORING

Edited by Daniel Balageas, ONERA, Chatillon, France,
Claus-Peter Fritzen, University of Siegen, Germany
and Alfredo Güemes, Polytechnic University of Madrid, Spain

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Structural Health Monitoring is organized around the various sensing techniques used to achieve structural health monitoring. The main emphasis is on sensors, signal and data reduction methods and inverse techniques allowing the identification of the physical parameters affected by the presence of the damage on which diagnostic is established.

Structural Health Monitoring is not oriented by the type of applications or linked to special classes of problems, but presents the broader families of techniques: vibration and modal analysis; optical fibre sensing; acousto-ultrasonics using piezoelectric transducers; and electric and electromagnetic techniques.

Each chapter has been written by experienced specialists in the topic, who have a broad practical experience. The book is suitable for beginners in the field and students, but the exhaustive overview of present research and development, and numerous references also make it ideal for experienced researchers and engineers.

Contents

1. Introduction to SHM – Daniel L. Balageas. 2. Vibration-based techniques for SHM – Claus-Peter Fritzen. 3. Fiber optic sensors – Alfredo Güemes and José M. Menendez. 4. SHM with piezoelectric sensors – Philippe Guy and Thomas Monnier. 5. SHM using electrical resistance – Michelle Salvia and Jean-Christophe Abry. 6. Low frequency electromagnetic techniques – Michel B. Lemistre. 7. Capacitive methods for SHM in civil engineering – Xavier Derobert and Jean Iaquina.

The Editors

Daniel Balageas, deputy head of the Structures and Damage Mechanics Department (DMSE) at ONERA and part-time associate professor at ENS-Cachan, France, has forty years of experience in aerospace research.

Claus-Peter Fritzen, Professor of Mechanics within the Institute of Mechanics and Control-Mechatronics at the University of Siegen (Germany), is a researcher in the fields of vibrations, structural identification, smart structures and SHM.

Alfredo Güemes, is Professor of Material Science, Director of the Aerospace Materials & Processes Department at the Polytechnic University of Madrid and Co-Chairman of the Stanford International Workshops on SHM since 1997.

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