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BOOK REVIEW

FIBRE OPTIC METHODS FOR STRUCTURAL HEALTH MONITORING. Branko Glisic and Daniele Inaudi, John Wiley & Sons, Chichester, 2007. No. of pages: 262. ISBN 978-0470-06142-8

The book by Glisic and Inaudi is welcome by the international Scientific Community active in the field of structural health monitoring. The expertise collected by the authors in many years of applications is recorded in it. However, the book is much more than a mere list of successes. A backward presentation allows the reader to understand the single step motivations towards the target, that is, the technological application to Civil Engineering realizations.

Chapter 5 of the book spans from pages 133 to 249, and comes with the stimulating title 'Finite Element Structural Health Monitoring Strategies and Application Examples'. The applications are: pile foundations (5.2), buildings (5.3), bridges (5.4; including the Port Marghera cable-stayed bridge 5.4.10), dams (5.5), tunnels (5.6), heritage structures (5.7), pipelines (5.8).

The meaning of the title of Chapter 5 is explained by the following steps: 'the structure is divided into cells, each cell equipped with a sensor topology corresponding to the expected field strain in the cell, and then the results obtained from each cell are linked in order to retrieve the global structural behaviour'. The primary parameters (i.e. physical variables) one can monitor are average strain, average shear strain, average curvature, relative displacements, inclination, temperature and temperature gradients.

Thus, the subdivision of the structures in cells suggests the authors the FE-SHM (Finite Element Structural Health Monitoring) acronym. The cells are discussed in Chapter 4, where the simple topology, the parallel topology, the crossed topology and the triangular topology, respectively, are presented. These local assemblages locate in different ways the basic sensor element, which is the 'fibre-optic deformation sensor', discussed in Chapter 3. It is the core of the book.

Indeed Chapter 1 is just an introduction without any ambition to provide a broad state-of-the-art: it is rather focused on the goals to be achieved later in the book. Chapter 2 provides a qualitative description of fibre-optic sensors, that is, the basic technology for Chapter 3. The last one starts with clear statements on the difference between average deformation and actual deformation. One would expect a broad list of reference here, since this is the conceptual core of the book treatment. Indeed reference is only made to Serbian textbooks of difficult access for many readers. Section 3.2 is devoted to the definition/construction of the sensor basic element, which is a contact, relative-displacement device whose measurement re-elaborations allow one to derive information on the deformation between the device ends. Section 3.3 is a guide to the results interpretation, where the incremental nature of any assessment is well stated.

In conclusion, the book is useful for understanding one of the technology of structural monitoring for Civil Engineering applications today available on the market. But, even more

important, the book represents a good guideline for sensor placement and performance reconstruction from boundary (i.e. not internal to the structural body) measurements.

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