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Problems and Exercises; Chapter 6 Guided Waves; 6.1 Introduction; 6.2 Rayleigh Waves; 6.3 SH Plate Waves; 6.4 Lamb Waves; 6.5 General Formulation of Guided Waves in Plates; 6.6 Guided Waves in Tubes and Shells; 6.7 Guided Waves in Composite Plates; 6.8 Summary and Conclusions; 6.9 Problems and Exercises; Chapter 7 Piezoelectric Wafer Active Sensors; 7.1 Introduction; 7.2 PWAS Resonators; 7.3 Circular PWAS Resonators; 7.4 Coupled-Field Analysis of PWAS Resonators; 7.5 Constrained PWAS; 7.6 PWAS Ultrasonic Transducers 7.7 Durability and Survivability of Piezoelectric Wafer Active Sensors 7.8 Summary and Conclusions; 7.9 Problems and Exercises; Chapter 8 Tuned Waves Generated with Piezoelectric Wafer Active Sensors; 8.1 Introduction; 8.2 State of the Art; 8.3 Tuned Axial Waves Excited by PWAS; 8.4 Tuned Flexural Waves Excited by PWAS; 8.5 Tuned Lamb Waves Excited by PWAS; 8.6 Experimental Validation of PWAS Lamb-Wave Tuning in Isotropic Plates; 8.7 Directivity of Rectangular PWAS; 8.8 PWAS-Guided Wave Tuning in Composite Plates; 8.9 Summary and Conclusions; 8.10 Problems and Exercises Chapter 9 High-Frequency Vibration SHM with PWAS Modal Sensors - the Electromechanical Impedance Method 9.1 Introduction; 9.2 1-D PWAS Modal Sensors; 9.3 Circular PWAS Modal Sensors; 9.4 Damage Detection with PWAS Modal Sensors; 9.5 Coupled-Field FEM Analysis of PWAS Modal Sensors; 9.6 Summary and Conclusions; 9.7 Problems and Exercises; Chapter 10 Wave Propagation SHM with PWAS; 10.1 Introduction; 10.2 1-D Modeling and Experiments; 10.3 2-D PWAS Wave Propagation Experiments; 10.4 Pitch-Catch PWAS-Embedded NDE; 10.5 Pulse-Echo PWAS-Embedded NDE; 10.6 PWAS Time Reversal Method 10.7 PWAS Passive Transducers of Acoustic Waves

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## Sommario/riassunto

Structural Health Monitoring (SHM) is the interdisciplinary engineering field devoted to the monitoring and assessment of structural health and durability. SHM technology integrates remote sensing, smart materials, and computer based knowledge systems to allow engineers see how built up structures are performing over time. It is particularly useful for remotely monitoring large infrastructure systems, such as bridges and dams, and high profile mechanical systems such as aircraft, spacecraft, ships, offshore structures and pipelines where performance is critical but onsite monitoring is diff

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