



# Finite Element and Boundary Methods in Structural Acoustics and Vibration

*Noureddine Atalla, Franck Sgard*

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**Finite Element and Boundary Methods in Structural Acoustics and Vibration** Noureddine Atalla, Franck Sgard

*Effectively Construct Integral Formulations Suitable for Numerical Implementation*

**Finite Element and Boundary Methods in Structural Acoustics and Vibration** provides a unique and in-depth presentation of the finite element method (FEM) and the boundary element method (BEM) in structural acoustics and vibrations. It illustrates the principles using a logical and progressive methodology which leads to a thorough understanding of their physical and mathematical principles and their implementation to solve a wide range of problems in structural acoustics and vibration.

Addresses Typical Acoustics, Electrodynamics, and Poroelasticity Problems

It is written for final-year undergraduate and graduate students, and also for engineers and scientists in research and practice who want to understand the principles and use of the FEM and the BEM in structural acoustics and vibrations. It is also useful for researchers and software engineers developing FEM/BEM tools in structural acoustics and vibration.

This text:

- Reviews current computational methods in acoustics and vibrations with an emphasis on their frequency domains of applications, limitations, and advantages
- Presents the basic equations governing linear acoustics, vibrations, and poroelasticity
- Introduces the fundamental concepts of the FEM and the BEM in acoustics
- Covers direct, indirect, and variational formulations in depth and their implementation and use are illustrated using various acoustic radiation and scattering problems
- Addresses the exterior coupled structural-acoustics problem and presents several practical examples to demonstrate the use of coupled FEM/BEM tools, and more

Finite Element and Boundary Methods in Structural Acoustics and Vibration utilizes authors with extensive experience in developing FEM- and BEM-based formulations and codes and can assist you in effectively solving structural acoustics and vibration problems. The content and methodology have been thoroughly class tested with graduate students at University of Sherbrooke for over ten years.

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