



# Structural Acoustics and Vibration: Mechanical Models, Variational Formulations and Discretization

*Roger Ohayon, Christian Soize*

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## **Structural Acoustics and Vibration: Mechanical Models, Variational Formulations and Discretization**

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**Structural Acoustics and Vibration** presents the modeling of vibrations of complex structures coupled with acoustic fluids in the low and medium frequency ranges. It is devoted to mechanical models, variational formulations and discretization for calculating linear vibrations in the frequency domain of complex structures. The book includes theoretical formulations which are directly applicable to develop computer codes for the numerical simulation of complex systems, and gives a general scientific strategy to solve various complex structural acoustics problems in different areas such as spacecraft, aircraft, automobiles, and naval structures. The researcher may directly apply the material of the book to practical problems such as acoustic pollution, the comfort of passengers, and acoustic loads induced by propellers.

**Structural Acoustics and Vibration** considers the mechanical and numerical aspects of the problem, and gives original solutions to the predictability of vibrations of complex structures interacting with internal and external, liquid and gaseous fluids. It is a self-contained general synthesis with a didactic presentation and fills the gap between analytical methods applied to simple geometries and statistical methods, which are useful in high frequency structural acoustic problems.

### Key Features

- \* Provides for the first time complex structures in scientific literature
- \* Presents a self-contained general synthesis with a didactic presentation
- \* Integrates the most advanced research topics on the subject
- \* Enables the researcher to solve complex structural acoustics problems in areas such as spacecraft, aircraft, automobiles, and naval structures
- \* Fills the gap between analytical methods applied to simple geometries and statistical methods

Contains advanced mechanical and numerical modeling

- \* Provides appropriate formulations directly applicable for developing computer codes for the numerical simulation of complex systems

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