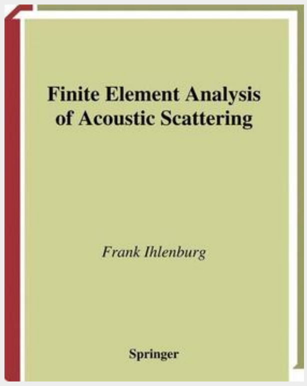
Ihlenburg

# Finite Element Analysis of Acoustic Scattering

A cognitive journey towards the reliable simulation of scattering problems using finite element methods, with the pre-asymptotic analysis of Galerkin FEM for the Helmholtz equation with moderate and large wave number forming the core of this book. Starting from the basic physical assumptions, the author methodically develops both the strong and weak forms of the governing equations, while the main chapter on finite element analysis is preceded by a systematic treatment of Galerkin methods for indefinite sesquilinear forms. In the final chapter, three dimensional computational simulations are presented and compared with experimental data. The author also includes broad reference material on numerical methods for the Helmholtz equation in unbounded domains, including Dirichlet-to-Neumann methods, absorbing boundary conditions, infinite elements and the perfectly matched layer. A self-contained and easily readable work.

Als ub ¨ erragende Gestalt.tritt unsHelmholtz entgegen.Seine außerordentliche Stellung in der Geschichte der Naturwissensch- ten beruht auf einer ungew¨ ohnlich vielseitigen, eindringenden Be- bung, innerhalb deren die mathematische Seite eine wichtige, fur ¨ uns naturlic ¨ h in erster Linie in Betracht kommende Rolle spielt. (Felix 1 Klein, [84, p. 223]) Waves are interesting physical phenomena with important practical app- cations. Physicists and engineers are interested in the reliable simulation of processes in which waves are scattered from obstacles (scattering pr- lems). This book deals with some of the mathematical issues arising in the computational simulation of wave propagation and ?uid–structure inter- tion. The linear mathematical models for wave propagation and scattering are well-known. Assuming time-harmonic behavior, one deals with the Helm- 2 holtz equation ? u + k u = 0, where the wave number k is a physical parameter. Our interest will be mainly in the numerical solution of ex- rior boundary value problems for the Helmholtz equation which we call Helmholtz problems for short.




**53,49 €**
49,99 € (zzgl. MwSt.)

*Lieferfrist: bis zu 10 Tage*

**Artikelnummer:** 9780387983196
**Medium:** Buch
**ISBN:** 978-0-387-98319-6
**Verlag:** Springer
**Erscheinungstermin:** 13.08.1998
**Sprache(n):** Englisch
**Auflage:** 1998
**Serie:** Applied Mathematical Sciences
**Produktform:** Gebunden
**Gewicht:** 1150 g
**Seiten:** 226
**Format (B x H):** 160 x 241 mm