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Nota di contenuto	DPSM FOR MODELING ENGINEERING PROBLEMS; CONTENTS; Preface; Contributors; Chapter 1 - Basic Theory of Distributed Point Source Method (DPSM) and Its Application to Some Simple Problems; 1.1 Introduction and Historical Development of DPSM; 1.2 Basic Principles of DPSM Modeling; 1.2.1 The fundamental idea; 1.2.1.1 Basic equations; 1.2.1.2 Boundary conditions; 1.2.2 Example in the case of a magnetic open core sensor; 1.2.2.1 Governing equations and solution; 1.2.2.2 Solution of coupling equations; 1.2.2.3 Results and discussion; 1.3 Examples From Ultrasonic Transducer Modeling 1.3.1 Justification of modeling a finite plane source by a distribution of point sources1.3.2 Planar piston transducer in a fluid; 1.3.2.1 Conventional surface integral technique; 1.3.2.2 Alternative DPSM for

computing the ultrasonic field; 1.3.2.3 Restrictions on r(s) for point source distribution; 1.3.3 Focused transducer in a homogeneous fluid; 1.3.4 Ultrasonic field in a nonhomogeneous fluid in the presence of an interface; 1.3.4.1 Pressure field computation in fluid 1 at point P; 1.3.4.2 Pressure field computation in fluid 2 at point Q
1.3.5 DPSM technique for ultrasonic field modeling in nonhomogeneous fluid1.3.5.1 Field computation in fluid 1; 1.3.5.2 Field in fluid 2; 1.3.6 Ultrasonic field in the presence of a scatterer; 1.3.7 Numerical results; 1.3.7.1 Ultrasonic field in a homogeneous fluid; 1.3.7.2 Ultrasonic field in a nonhomogeneous fluid - DPSM technique; 1.3.7.3 Ultrasonic field in a nonhomogeneous fluid - surface integral method; 1.3.7.4 Ultrasonic field in the presence of a finite-size scatterer; References; Chapter 2-Advanced Theory of DPSM-Modeling Multilayered Medium and Inclusions of Arbitrary Shape
2.1 Introduction2.2 Theory of Multilayered Medium Modeling; 2.2.1 Transducer faces not coinciding with any interface; 2.2.1.1 Source strength determination from boundary and interface conditions; 2.2.2 Transducer faces coinciding with the interface - case 1: transducer faces modeled separately; 2.2.2.1 Source strength determination from interface and boundary conditions; 2.2.2.2 Counting number of equations and number of unknowns; 2.2.3 Transducer faces coinciding with the interface - case 2: transducer faces are part of the interface 2.2.3.1 Source strength determination from interface and boundary conditions2.2.4 Special case involving one interface and one transducer only; 2.3 Theory for Multilayered Medium Considering the Interaction Effect on the Transducer Surface; 2.3.1 Source strength determination from interface conditions; 2.3.2 Counting number of equations and number of unknowns; 2.4 Interference between Two Transducers: Step-by-Step Analysis of Multiple Reflection; 2.5 Scattering by an Inclusion of Arbitrary Shape; 2.6 Scattering by an Inclusion of Arbitrary Shape - An Alternative Approach
2.7 Electric Field in a Multilayered Medium

Sommario/riassunto

This book is the first book on this technique; it describes the theory of DPSM in detail and covers its applications in ultrasonic, magnetic, electrostatic and electromagnetic problems in engineering. For the convenience of the users, the detailed theory of DPSM and its applications in different engineering fields are published here in one book making it easy to acquire a unified knowledge on DPSM.