

Electromagnetic Fields in Cavities: Deterministic and Statistical Theories

By David A. Hill

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Electromagnetic Fields in Cavities: Deterministic and Statistical Theories By David A. Hill

A thorough and rigorous analysis of electromagnetic fields in cavities

This book offers a comprehensive analysis of electromagnetic fields in cavities of general shapes and properties.

Part One covers classical deterministic methods to conclude resonant frequencies, modal fields, and cavity losses; quality factor; mode bandwidth; and the excitation of cavity fields from arbitrary current distributions for metal-wall cavities of simple shape.

Part Two covers modern statistical methods to analyze electrically large cavities of complex shapes and properties.

Electromagnetic Fields in Cavities combines rigorous solutions to Maxwell's equations with conservation of energy to solve for the statistics of many quantities of interest: penetration into cavities (and shielding effectiveness), field strengths far from and close to cavity walls, and power received by antennas within cavities. It includes all modes and shows you how to utilize fairly simple statistical formulae to apply to your particular problem, whether it's interference calculations, electromagnetic compatibility testing in reverberation chambers, measurement of shielding materials using multiple cavities, or efficiency of test antennas. *Electromagnetic Fields in Cavities* is a valuable resource for researchers, engineers, professors, and graduate students in electrical engineering.

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Editorial Review

About the Author
David A. Hill is a Guest Researcher at the National Institute of Standards and Technology (NIST) specializing in cavity theory and reverberation chamber applications. Previously, he held project leader positions with the Institute for Telecommunication Sciences and NIST. Since 1980, he has been an Adjunct Professor in the Department of Electrical and Computer Engineering at the University of Colorado at Boulder, where he teaches graduate courses in electromagnetics and advises graduate students on master's and PhD theses. Dr. Hill is an IEEE Life Fellow and a member of URSI Commissions A, B, E, and F. He has won IEEE EMC Society Prize Paper Awards for "Out-of-Band Response of Antenna Arrays" in 1987 and "On Determining the Maximum Emissions from Electrically Large Sources" in 2002.

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