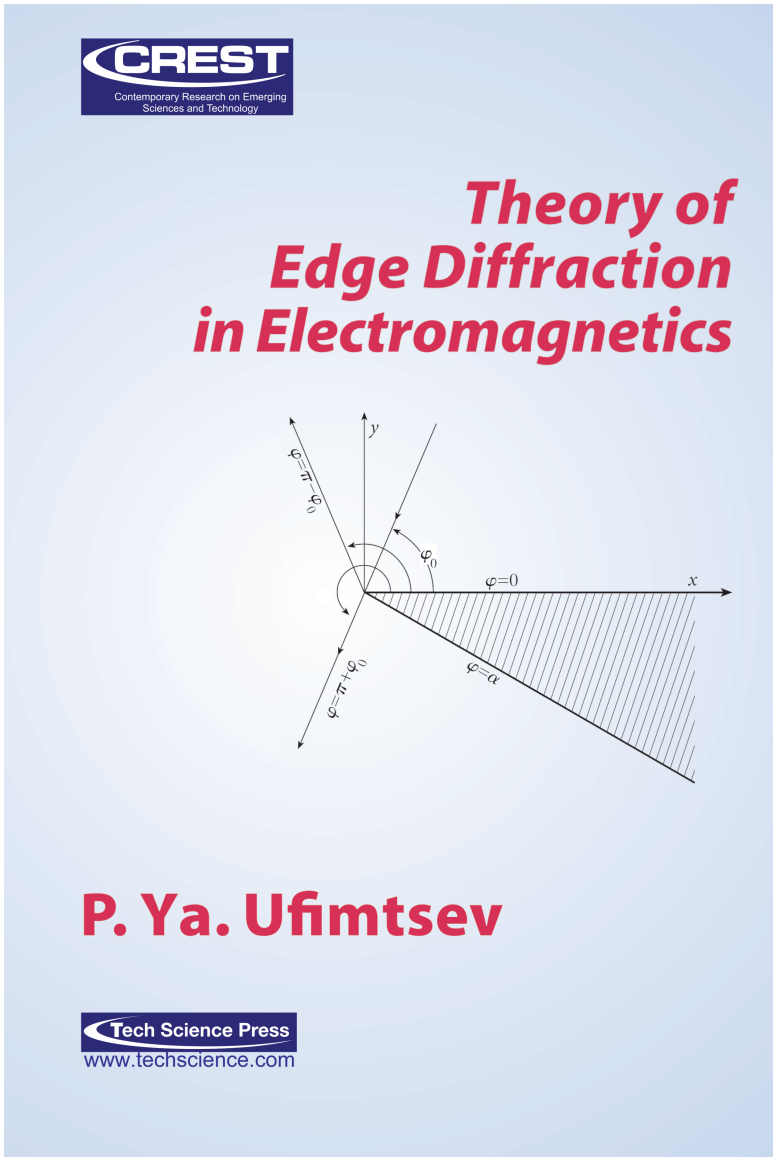

This monograph categorizes and summarizes the work of P. Y. Ufimtsev, and is mainly connected with research on edge diffracted waves. This research stemmed from practical considerations and focused on the development of approximate methods to calculate the scattering of electromagnetic waves from real objects.

"The Lockheed F–117 Stealth Fighter and the Northrop B–2 Stealth Bomber play key roles in today's United States Air Force.

These were the first two major aircraft designs to employ the principles of Pyotr Ufimtsev's Physical Theory of Diffraction (PTD). Ben Rich, who oversaw the F–117 project as head of Lockheed's fabled Skunk Works, refers to Professor Ufimtsev's work as "the Rosetta Stone breakthrough for stealth technology." At Northrop, where I worked on the B–2 project, we were so enthusiastic about PTD that a co-worker and I sometimes broke into choruses of "Go Ufimtsev" to the tune of "On, Wisconsin."

And so today the rather abstract physics and mathematics developed by this charming and unassuming old-world gentleman are influencing military strategy and tactics and thus helping shape history - not just through the F–117 and the B–2, but through the many military systems of many kinds that now incorporate stealth technology based on PTD." *From the "Foreword", by Kenneth M. Mitzner.*

Contents: Introduction; Review of Edge Diffraction Techniques; **Chapter 1** Diffraction of Electromagnetic Waves at Black Bodies: Generalization of Kirchhoff-Kottler Theory; **Chapter 2** Edge Diffraction at Convex Perfectly Conducting Bodies: Elements of the Physical Theory of Diffraction; **Chapter 3** Edge Diffraction at Concave Surfaces: Extension of the Physical Theory of Diffraction; **Chapter 4** Measurement of Radiation from Diffraction / Nonuniform Currents; **Chapter 5** Analysis of Wedge Diffraction Using the Parabolic Equation Method; **Chapter 6** Current Waves on Thin Conductors and Strips; **Chapter 7** Radiation of Edge Waves: Theory Based on the Reciprocity Theorem; **Chapter 8** Functional and Integral Equations for Strip Diffraction (Neumann Boundary Problem); **Chapter 9** Asymptotic Representation for the Current Density on a Strip; **Chapter 10** Asymptotic Representation for the Scattering Pattern; **Chapter 11** Plane Wave Diffraction at a Strip Oriented in the Direction of Polarization (Dirichlet Boundary Problem); **Chapter 12** Edge Diffraction at Open-Ended Parallel Plate Resonator; Conclusions; References; **Appendix:** Relationships Between the Gaussian System (GS) and the System International (SI) for Electromagnetic Units. *About 420 pages.*

A very comprehensive list of more than 150 references to the literature is included.

About the author

Pyotr Ya. Ufimtsev, is known for his works in the theory of diffraction and propagation of electromagnetic and acoustic waves. Among his fundamental results are the theory of scattering from black bodies, the Physical Theory of Diffraction (PTD), and the discovery of new physical phenomena related to surface waves in absorbing layers. PTD is used worldwide in the design of microwave antennas and in calculations of radar cross-section of scattering objects. In particular, this theory was used in the design of American aircraft invisible to radar (stealth aircraft).

P. Ya. Ufimtsev was affiliated with a number of research and academic institutes, including Central Research Radio Engineering Institute (Engineer, Senior Engineer, Senior Scientist, Moscow, 1954–1973); Institute of Fundamental Technical Problems (Guest Scientist, Warsaw, 1979); Moscow Aviation Institute (Institute Professor, 1980–1987); Institute of Radio Engineering and Electronics of Academy of Sciences (Senior Scientist, Head Scientist, Moscow, 1973-1990); University of California at Los Angeles (Visiting Professor, Adjunct Professor, 1990-2003); Singapore National University (Guest Professor, 1993); Air Force Institute of Technology (Guest Professor, Dayton, Ohio, 1994, 1999); Phraxos R&D Inc. (Chief Scientist, Santa Monica, California, 1994); Northrop Grumman Corp. (Principal Engineer, California, 1995–2000). Currently he is affiliated with the University of California at Irvine.

For his outstanding scientific achievements Dr. Ufimtsev was awarded by the USSR State Prize (Moscow, 1990), the Leroy Randle Grumman Medal (New York, 1991), the 20th Century Award Medal, and the Hall of Fame Medal (U.K., Cambridge, 1996). He was elected a Member of the Electromagnetics Academy (MIT, 1989), Associate Fellow of AIAA (1992), and Fellow of IEEE (1999). He is listed in Who's Who in the World and Who's Who in Science and Engineering.

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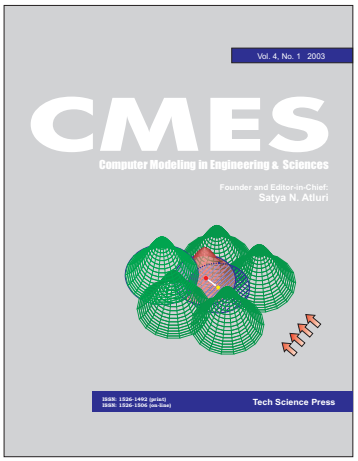
The Editor of the CREST series, Professor Satya N. Atluri of UCI, is pleased that the Theory of Edge Diffraction in Electromagnetics, by Professor Ufimtsev, who pioneered much of that theory, is a part of this series. He hopes that this milestone-work in the development of the science of electromagnetics, would be of tremendous interest to contemporary, as well as future generations of scholars in this discipline.



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