Ultrawideband Phased Array Antenna Technology for Sensing and Communications Systems (MIT Lincoln Laboratory Series)

By Alan J. Fenn, Peter T. Hurst

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Ultrawideband phased array antennas are an enabling technology for many ground-based and airborne communications and radar systems. This book surveys electromagnetic theory and phased array antenna theory and provides examples of ultrawideband phased array antenna technology. It describes some of the research on ultrawideband phased arrays undertaken by the authors and their colleagues at MIT Lincoln Laboratory over the last ten years. The book focuses on experimental prototype ultrawideband phased array technology developed at Lincoln Laboratory for applications in the VHF and UHF bands from approximately 100 MHz to 1 GHz, and addresses dipole, monopole, loop, and other antenna array elements. It offers examples of antennas for both airborne and ground vehicle applications. Most of the examples are developed in the context of rapid prototyping for quick assessment of communications and radar systems feasibility, with measurements and numerical electromagnetic simulation results provided for many prototype examples.

The book is intended primarily for practicing antenna engineers, radar engineers, and communications engineers, and for graduate students and researchers in electrical engineering. Readers need no prior knowledge of ultrawideband antennas, although some background in electromagnetic theory, antennas, radar, and communications would be helpful.

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Editorial Review

Review

This is an interesting and useful text, written from a unique perspective. The book provides a good introduction to the theory of arrays, but its uniqueness is in presenting the bulk of its material as a collection of detailed specific designs of ultrawideband prototype arrays. These were developed at Lincoln Laboratory by the authors and colleagues. Applications cover from roughly 100 MHz to 1 GHz, and offer excellent examples of modern array technology.

(Robert J. Mailloux, author of *Phased Array Antenna Handbook*)

The last ten years have brought remarkable developments in thin and conformal ultrawideband arrays. Growing bandwidth scarcity and spectrum management requirements make the introduction of these wideband arrays, with 10:1 bandwidth or more, a timely development. Concurrently, bandwidth limits have been derived, providing for a theoretical understanding of the operation and limitations of thin ultrawideband arrays. This book is written by authors who have extensive practical and theoretical experience in the subject. It is a welcomed and timely book on a subject that will continue to grow in importance in the years to come.

(John L. Volakis, R & L Chope Chair Professor, ElectroScience Lab Director, The Ohio State University)

About the Author

Alan J. Fenn is a Senior Staff Member in the RF Technology Group at MIT Lincoln Laboratory. Peter T. Hurst is a Technical Staff Member in the Advanced Capabilities and Systems Group at Lincoln Laboratory.

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