
PIER 3

Progress in Electromagnetics Research

Polarimetric Remote Sensing

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PIER 1**Progress in Electromagnetics Research****Jin Au Kong****PIER 2****Finite Element and Finite Difference Methods in
Electromagnetic Scattering****Michael A. Morgan****PIER 3****Polarimetric Remote Sensing****Jin Au Kong**

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Polarimetric Remote Sensing

Editor:

Jin Au Kong

Massachusetts Institute of Technology

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PREFACE

Polarimetric remote sensing has become an important tool in the monitoring of the earth and its environment. Recent advancements in instrumentation and theoretical modeling developments have been progressing rapidly. This volume of PIER 3 is devoted to the theory, modeling, and applications of polarimetric remote sensing at microwave and millimeter wavelengths.

Theoretical issues of modeling the earth terrain for polarimetric remote sensing are the topic of the first three chapters. In Chapter 1, a layered random medium model is developed for earth terrain media, followed by Chapter 2 where the random discrete scatterers model is treated with the vector radiative transfer theory. In Chapter 3, random rough surface scattering theories and polarization properties in surface imaging are discussed.

With the imageries obtained from polarimetric synthetic aperture radar, the statistical properties are investigated in Chapter 4 from the point of view of multivariate K-distribution. In Chapter 5, the observed polarimetric scattering characteristics of land, geology, vegetation, and sea ice are examined. Chapter 6 addresses the issue of classification and maximum contrast of earth terrain using the polarimetric synthetic aperture radar images.

Chapter 7 discusses polarimetric imaging data as analysis tools and applies to geological processes and paleoclimatology and forestry ecology. In Chapter 8, polarimetric measurement methodologies at millimeter wavelengths are studied with examples given for 95 GHz and 225 GHz polarimeters. The calibration issue for polarimetric radars using in-scene reflectors is discussed in Chapter 9.

The present volume is intended for researchers and students who are in the field of polarimetric remote sensing. The Editor wishes to thank all the authors for contributing to this timely volume in the Progress in Electromagnetics Research series. The editing and the preparation of the manuscript are due to the tireless efforts of Son Nghiem and Anh Lieu.

J. A. Kong

*Cambridge, Massachusetts
March, 1990*

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CONTRIBUTORS

- A. J. Blanchard, *Space Technology and Research Center*
The Woodlands, Texas 77381, USA
- M. Borgeaud, *European Space Agency*
2200 AG Noordwijk, The Netherlands
- M. F. Chen, *University of Texas at Arlington*
Arlington, Texas 76019, USA
- K. H. Ding, *New Mexico State University*
Las Cruces, New Mexico 88003, USA
- D. Evans, *Jet Propulsion Laboratory*
Pasadena, California 91109, USA
- A. K. Fung, *University of Texas at Arlington*
Arlington, Texas 76019, USA
- J. K. Jao, *MIT Lincoln Laboratory*
Lexington, Massachusetts 02173, USA
- J. A. Kong, *Massachusetts Institute of Technology*
Cambridge, Massachusetts 02139, USA
- T. Le Toan, *Centre d'Etude Spatiale des Rayonnements*
Toulouse Cedex, France
- H. H. Lim, *Massachusetts Institute of Technology*
Cambridge, Massachusetts 02139, USA

- R. E. McIntosh**, *University of Massachusetts*
Amherst, Massachusetts 01003, USA
- J. B. Mead**, *University of Massachusetts*
Amherst, Massachusetts 01003, USA
- S. V. Nghiem**, *Massachusetts Institute of Technology*
Cambridge, Massachusetts 02139, USA
- H. Öttl**, *German Aerospace Research Establishment DLR*
NE-HF, Oberpfaffenhofen, Federal Republic of Germany
- R. T. Shin**, *Massachusetts Institute of Technology*
Cambridge, Massachusetts 02139, USA
- L. Tsang**, *University of Washington*
Seattle, Washington 98195, USA
- J. J. van Zyl**, *Jet Propulsion Laboratory*
Pasadena, California 91109, USA
- B. Wen**, *University of Washington*
Seattle, Washington 98195, USA
- S. H. Yueh**, *Massachusetts Institute of Technology*
Cambridge, Massachusetts 02139, USA
- H. A. Zebker**, *Jet Propulsion Laboratory*
Pasadena, California 91109, USA