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Autore	Franceschetti Giorgio
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	 Models; 3.1. Introduction and Chapter Outline; 3.2. Fundamentals of Fractal Sets; 3.3. Mathematical versus Physical Fractal Sets; 3.4. Deterministic versus Stochastic Fractal Description of Natural Surfaces; 3.5. Fractional Brownian Motion Process; 3.6. Weierstrass-Mandelbrot Function; 3.7. Connection between fBm and WM Models; 3.8. A Chosen Reference Fractal Surface for the Scattering Problem; 3.9. Fractal- Surface Models and their Comparison with Classical Ones; 3.10. References and Further Readings Appendix 3.A Generalized FunctionsAppendix 3.B Space-Frequency and Space-Scale Analysis of Nonstationary Signals; Chapter 4. Analytic Formulations of Electromagnetic Scattering; 4.1. Introduction and Chapter Outline; 4.2. Maxwell Equations; 4.3. The Integral-Equation Method; 4.4. Incident and Scattered-Field Coordinate-Reference Systems; 4.5. The Kirchhoff Approximation; 4.6. Physical-Optics Solution; 4.7. Extended-Boundary-Condition Method; 4.8. Small- Perturbation Method; 4.9. References and Further Readings Chapter 5. Scattering from Weierstrass-Mandelbrot Surfaces: Physical- Optics Solution5.1. Introduction and Chapter Outline; 5.2. Analytic Derivation of the Scattered Field; 5.3. Scattered-Field Structure; 5.4. Limits of Validity; 5.5. Influence of Fractal and Electromagnetic Parameters over the Scattered Field; 5.6. Statistics of the Scattered Field; 5.7. References and Further Readings; Chapter 6. Scattering from Fractional Brownian Surfaces: Physical-Optics Solution; 6.1. Introduction and Chapter Outline; 6.2. Scattered Power-Density Evaluation; 6.3. Scattered Power Density Evaluation; 6.3. Scattered Power Density 6.4. Scattered Power Density: Special Cases
Sommario/riassunto	This book provides a comprehensive overview of electromagnetic scattering from natural surfaces, ranging from the classical to the more recent (fractal) approach. As remote sensing applications become increasingly important, this text provides readers with a solid background in interpretation, classification and thematization of microwave images. The "scattering problem? is discussed in detail with emphasis on its application to electromagnetic wave propagation, remote sensing, radar detection, and electromagnetic diagnostics. Natural surface and fractals complete this treatise focusing on how