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Electromagnetic Fields

4.3 Electromagnetic Field Diffusion in Conductive Media4.4 Electromagnetic Waves; References and Recommended Reading; Chapter 5. Electromagnetic Fields in Horizontally Stratified Media; 5.1 Plane Wave Propagation in a Layered Earth; 5.2 Spectral Method of Computing EM Fields in Horizontally Stratified Media; 5.3 Electromagnetic Field of an Arbitrary System of Magnetospheric Currents in a Horizontally Homogeneous Medium; 5.4 Electromagnetic Fields Generated in Layered Earth by Electric and Magnetic Dipole Transmitters; References and Recommended Reading Chapter 6. Electromagnetic Fields in Inhomogeneous Media6.1 Integral Equation Method; 6.2 Integral Equation Method in Models with Inhomogeneous Background Conductivity; 6.3 Family of Linear and Nonlinear Integral Approximations of the Electromagnetic Field; 6.4 Differential Equation Methods; References and Recommended Reading; Part III: Inversion and Imaging of Electromagnetic Field Data; Chapter 7. Principles of Ill-Posed Inverse Problem Solution; 7.1 Ill-Posed Inverse Problems; 7.2 Foundations of Regularization Theory; 7.3 Regularization Parameter; References and Recommended Reading Chapter 8. Electromagnetic Inversion8.1 Linear Inversions; 8.2 Nonlinear Inversion; 8.3 Quasi-Linear Inversion; 8.4 Quasi-Analytical Inversion; References and Recommended Reading; Chapter 9. Electromagnetic Migration; 9.1 Electromagnetic Migration in the Time Domain; 9.2 Analytic Continuation and Migration in the (k_x) Domain; 9.3 Finite Difference Migration; 9.4 Visualization of Geoelectric Structures by Use of Migration in the Frequency and Time Domains; 9.5 Migration Versus Inversion; References and Recommended Reading; Part IV: Geophysical Electromagnetic Methods Chapter 10. Electromagnetic Properties of Rocks and Minerals

Sommario/riassunto

In this book the author presents state-of-the-art geophysical electromagnetic (EM) theory and methods of EM geophysics. The book brings together fundamental theory of EM field and practical aspects of EM exploration for mineral and energy resources. The book is divided in four parts covering the foundations of the field theory and its applications to the applied electromagnetic geophysics, including new emerging methods of the marine EM exploration. The first part is an introduction to the field theory required for understanding the basics of geophysical electromagnetic theory. The second