

Contents

Foreword	V
1. Basic Mathematics and General Theory	
<i>U. Tautenhahn, D. Schweigert</i> Effective Numerical Methods for Solving Implicit Ill-Posed Inverse Problems	3
<i>B. Hofmann, R. Hausding</i> On the Data Error Influence in Determining a Specific Response Function	21
<i>T. D. Van, D. N. Hào, R. Gorenflo</i> Approximating the Solution to the Cauchy Problem and the Boundary Value Problem for the Laplace Equation	35
<i>R. S. Rutman</i> On Numerical Integration/Differentiation of Fractional Order: a Systems Theory Approach	49
<i>G. Inglese</i> Recent Results in the Study of the Moment Problem	73
<i>L. Ballani, D. Stromeier</i> On the Structure of Uniqueness in Linear Inverse Source Problems	85
<i>V. Bezvoda, J. Hrabe, K. Segeth</i> Fast Algorithm for Solving Potential Field Problems	99
2. Gravity and Magnetism	
<i>O. I. Kounchev</i> Solving Inverse Problems for Potential Fields for Nonuniform Data with Error	109
<i>G. N. Tsokas, C. B. Papazachos</i> The Applicability of Two-dimensional Inversion Filters in Magnetic Prospecting for Buried Antiquities	121
3. Geoelectrics and Electromagnetics	
<i>A. Hördt, K.-M. Strack, K. Vozoff, P. A. Wolfgram</i> Resolving Resistive Layers using Joint Inversion of LOTEM and MT Data	147

<i>H. Holstein, J. W. Wilkinson</i>	
An Analysis of the Broad Spectrum Apparent Complex Resistivity Method	159

4. Seismics

<i>A. K. M. Sarwar, K. W. Holladay</i>	
An Efficient Algorithm for Impedance Reconstruction by the Modified Gelfand-Levitan Inverse Method	179
<i>R. Guney, E. F. Benson, A. K. M. Sarwar</i>	
Imaging of the Earth by Iterative Reconstruction Methods	191
<i>E. F. Benson, R. Guney, A. K. M. Sarwar</i>	
Reverse-time Migration of Crosshole Data using Tomographic Velocities	211
<i>M. Novotný</i>	
From Radon to Kirchhoff Migration	231
<i>H. Freter</i>	
An Integral Equation Method for Seismic Modelling and Inversion	243
<i>V. Bardan</i>	
Inverse Scattering for Goupillaud Horizontally Layered Earth Model	265
<i>C. Kurtulus, M. Alpmen</i>	
Spectral Analysis of Blast Vibrations from Large Explosions	283
<i>A. S. Bykovtsev, V. A. Cheverda, V. G. Khaidukov</i>	
Optimization Approach to the Earthquake Source Inverse Problem	309

5. Geothermics

<i>J. Šafanda</i>	
Reconstruction of the Surface Temperature History by the Least-squares Inversion Theory	327

6. Joint Inversion of Geophysical Data

<i>G. Strykowski</i>	
Empirical Covariance Functions between Seismic, Density and Gravity Data – an Important Constraint in 3D Gravimetric-Seismic Stochastic Inversion	335
<i>S. Švancara, J. Halir</i>	
Iterative Simultaneous Inversion of Gravity and Seismic Traveltime Data: I – Formulas	361