## CONTENTS

Contributor List........................................................................................................... v
Preface......................................................................................................................... vii
Acknowledgments ........................................................................................................ xi

1 Experience of Regional Prediction of Hydrocarbon Deposits Prospecting in the Vicinity of Ural Oil and Gas Provinces  
   Vladimir S. Druzhinin, Vjacheslav Osipov, and Nikolay Nachapkin ............ 1

2 Wavelet-Based Multifractal Analysis of Landsat 8 Images: Applications to Mineral Deposits and Shale Gas Reservoirs  
   Orietta Nicolis ........................................................................................................... 19

3 Seismic Signal Denoising Using Empirical Mode Decomposition  
   Said Gaci ............................................................................................................... 47

4 A Lithological Segmentation Technique From Well Logs Using the Hilbert-Huang Transform  
   Said Gaci ............................................................................................................... 61

5 Seismic UNIX and GNU Octave for VSP Data Processing and Interpretation  
   Mohammed Farfour and Wang Jung Yoon .......................................................... 73

6 Seismic Spectral Decomposition Applications in Seismic: A Review and Application  
   Mohammed Farfour, Jalal Ferahtia, Noureddine Djarfour, and Mohand Amokrane Aitouch .............................................................. 93

7 Electromagnetic Geophysical Research with Controlled Source  
   Olga Hachay and Oleg Khachay ........................................................................... 115

8 Reflection of Processes of Nonequilibrium Two-Phase Filtration in Oil-Saturated Hierarchic Medium by Data of Active Wave Geophysical Monitoring  
   Olga Hachay and Andrey Khachay .................................................................... 135
9 Defining the Surface of the Fluid-Saturated Porous Inclusion in the Hierarchic Layered-Block Medium According to Electromagnetic Monitoring Data
Olga Hachay and Andrey Khachay ................................................................. 143

10 Hardware and Software System for Research in Oil and Gas Boreholes
Yury G. Astrakhantsev, Nadezhda A. Beloglazova, and Eugenia Bazhenova ................................................................................................. 153

11 Application of Borehole Magnetometry to Study Oil and Gas Deposits in Western Siberia
Galina V. Igolkina ............................................................................................ 167

12 A Novel Model to Estimate S-Wave Velocity Integrating Hölderian Regularity, Empirical Mode Decomposition, and Multilayer Perceptron Neural Networks
Said Gaci ........................................................................................................ 181

13 Geophysical Method of Defining Residual and Active Rock Stresses
Kushbakali Tazhibaev and Daniyar Tazhibaev ............................................. 201

14 On the Possibility of Using Mobile and Direct-Prospecting Geophysical Technologies to Assess the Prospects of Oil-Gas Content in Deep Horizons
Sergey Levashov, Nikolay Yakymchuk, and Ignat Korchagin ..................... 209

15 Anomalies of Low Density in the Crystalline Crust of Thermobaric Origin: A New Insight into Migration and Localization of Hydrocarbons
Valery Korchin .................................................................................................. 237

16 The Use of Aeromagnetics and Micromagnetics to Identify Potential Areas of Hydrocarbons in the Midcontinental United States: Caveats and Pitfalls
Steven A. Tedesco ........................................................................................... 259

Index .................................................................................................................. 277