GEOPHYSICS®

Society of Exploration Geophysicists
The international society of applied geophysics

VOL. 78, No. 6 | November-December 2013

EDITOR'S CORNER

This issue of GEOPHYSICS, *Evert Slob, Editor* 1ND

TECHNICAL PAPERS

GEOPHYSICS LETTERS

The peak frequency of direct waves for microseismic events, *Leo Eisner, Davide Gei, Miroslav Hallo, Ivo Opršal, and Mohammed Y. Ali* A45

CASE HISTORIES

Time-lapse seismic data registration and inversion for CO_2 sequestration study at Cranfield, *Rui Zhang, Xiaolei Song, Sergey Fomel, Mrinal K. Sen, and Sanjay Srinivasan* B329

High-resolution 2D seismic imaging and forward modeling of a polymetallic sulfide deposit at Garpenberg, central Sweden, *Omid Ahmadi, Christopher Juhlin, Alireza Malehmir, and Mie Munck* B339

A new regional/residual separation for magnetic data sets using susceptibility from frequency-domain electromagnetic data, *Peter Tschirhart, Bill Morris, and Greg Hodges* B351

ANISOTROPY

Anisotropic frequency-dependent spreading of seismic waves from first-arrival vertical seismic profile data analysis, *Amin Baharvand Ahmadi and Igor Morozov* C41

Moveout approximations for P- and SV-waves in dip-constrained transversely isotropic media, *Véronique Farra and Ivan Pšenčík* C53

BOREHOLE GEOPHYSICS AND ROCK PROPERTIES

Complex conductivity tensor of anisotropic hydrocarbon-bearing shales and mudrocks, *A. Revil, W. F. Woodruff, C. Torres-Verdín, and M. Prasad* D403

Viscoelasticity of Ells River bitumen sand and 4D monitoring of thermal enhanced oil recovery processes, *James W. Spencer, Jr.* D419

Magnetization vector imaging for borehole magnetic data based on magnitude magnetic anomaly, *Shuang Liu, Xiangyun Hu, Tianyou Liu, Jie Feng, Wenli Gao, and Liquan Qiu* D429

A dynamic adaptive radial basis function approach for total organic carbon content prediction in organic shale, *Maojin Tan, Qiong Liu, and Songyang Zhang* D445

Relating nuclear magnetic resonance relaxation time distributions to void-size distributions for unconsolidated sand packs, *Kristina Keating and Samuel Falzone* D461

Inversion-based petrophysical interpretation of logging-while-drilling nuclear and resistivity measurements, *Olabode Ijasan, Carlos Torres-Verdín, and William E. Preeg* D473

Mapping formation shear-velocity variation by inverting logging-while-drilling quadrupole-wave dispersion data, *Yuan-Da Su, Xiao-Ming Tang, Chun-Xi Zhuang, Song Xu, and Long Zhao* D491

Novel finite-element approach applied to borehole quadrupole dispersion analysis in stress-sensitive formations, *Ole Jørgensen and Dan Burns* D499

Sensitivity study of rock-physics parameters for modeling time-lapse seismic response of Norne field, *Amit Suman and Tapan Mukerji* D511

Wavefield simulation and analysis with the finite-element method for acoustic logging while drilling in horizontal and deviated wells, *Hua Wang, Guo Tao, and Kuo Zhang* D525

Extended Walton third-order elastic coefficients modified by an anisotropic and stress-dependent coordination number, *Jeremy Gallop* D545

ISSN 0016-8033 (print)
ISSN 1942-2156 (online)

Contents continued on inside front cover

GEOPHYSICS®

VOL. 78, No. 6 | November-December 2013

Continued from front cover

ELECTRICAL AND ELECTROMAGNETIC METHODS

Robust and accelerated Bayesian inversion of marine controlled-source electromagnetic data using parallel tempering, *Anandaroop Ray, David L. Alumbaugh, G. Michael Hoversten, and Kerry Key* **E271**

Quantifying surface-to-reservoir electromagnetics for waterflood monitoring in a Saudi Arabian carbonate reservoir, *Daniele Colombo and Gary Wayne McNeice* **E281**

Long and short narrow pore models for membrane polarization, *Matthias Bücker and Andreas Hördt* **E299**

Joint contrast source inversion of marine magnetotelluric and controlled-source electromagnetic data, *Torgeir Wiik, Ketil Hokstad, Bjørn Ursin, and Lutz Mütschard* **E315**

ENGINEERING AND ENVIRONMENTAL GEOPHYSICS

The inversion of surface-NMR T_1 data for improved aquifer characterization, *Mike Müller-Petke, Jan O. Walbrecker, and Rosemary Knight* **EN83**

Window-controlled CMP crosscorrelation analysis for surface waves in laterally heterogeneous media, *Tatsunori Ikeda, Takeshi Tsuji, and Toshifumi Matsuoka* **EN95**

Imaging scatterers in landfills using seismic interferometry, *Laura Amalia Konstantaki, Deyan Draganov, Timo Heimovaara, and Ranajit Ghose* **EN107**

High-frequency seismic response during permeability reduction due to biopolymer clogging in unconsolidated porous media, *Tae-Hyuk Kwon and Jonathan B. Ajo-Franklin* **EN117**

GEOPHYSICAL SOFTWARE AND ALGORITHMS

A simple and exact acoustic wavefield modeling code for data processing, imaging, and interferometry applications, *Erica Galetti, David Halliday, and Andrew Curtis* **F17**

GEOPHYSICS®

VOL. 78, No. 6 | November-December 2013

SEISMIC ATTRIBUTES AND PATTERN RECOGNITION

Seismic data decomposition into spectral components using regularized nonstationary autoregression, *Sergey Fomel* O69

SEISMIC DATA ACQUISITION

Repeatability issues of high-frequency signals emitted by air-gun arrays, *Martin Landrø, Lasse Amundsen, and Jan Langhammer* P19

SEISMIC INVERSION

Wave-equation reflection traveltime inversion with dynamic warping and full-waveform inversion, *Yong Ma and Dave Hale* R223

A critical appraisal of asymptotic 3D-to-2D data transformation in full-waveform seismic crosshole tomography, *Ludwig Auer, André Marc Nuber, Stewart Alan Greenhalgh, Hansruedi Maurer, and Stefano Marelli* R235

Application of the variable projection scheme for frequency-domain full-waveform inversion, *Maokun Li, James Rickett, and Aria Abubakar* R249

Double-difference elastic-waveform inversion with prior information for time-lapse monitoring, *Zhigang Zhang and Lianjie Huang* R259

SEISMIC MIGRATION

Selecting an optimal aperture in Kirchhoff migration using dip-angle images, *Alexander Klokov and Sergey Fomel* S243

High-resolution imaging of diffractions — A window-steered MUSIC approach, *Leiv-J. Gelius, Martin Tygel, André K. Takahata, Endrias G. Asgedom, and Dany R. Serrano* S255

Elastic imaging with exact wavefield extrapolation for application to ocean-bottom 4C seismic data, *Matteo Ravasi and Andrew Curtis* S265

SEISMIC VELOCITY/STATICS

Polarization-based wave-equation migration velocity analysis in acoustic media, *Qunshan Zhang and George A. McMechan* U77

First-break traveltime tomography with the double-square-root eikonal equation, *Siwei Li, Alexander Vladimirsky, and Sergey Fomel* U89

SIGNAL PROCESSING

Random denoising and signal nonlinearity approach by time-frequency peak filtering using weighted frequency reassignment, *Hongbo Lin, Yue Li, Baojun Yang, and Haitao Ma* V229

On robust estimation of discrete Hilbert transform of noisy data, *Indrajit G. Roy* V239

Adaptive multiple subtraction based on 3D blind separation of convolved mixtures, *Zhong-xiao Li and Wen-kai Lu* V251

On seismic deghosting by spatial deconvolution, *Lasse Amundsen, Hongbo Zhou, Arne Reitan, and Arthur B. Weglein* V267

Tensor completion based on nuclear norm minimization for 5D seismic data reconstruction, *Nadia Kreimer, Aaron Stanton, and Mauricio D. Sacchi* V273

TUTORIALS AND EXPOSITORY DISCUSSIONS

Helicopter time-domain electromagnetics — Newmont and the NEWTEM experience, *Perry A. Eaton, Robert G. Anderson, Steven V. Queen, Bruno Y. Nilsson, Eric Lauritsen, Colin T. Barnett, Mark Olm, and Steven Mitchell* W45

Continued on page ii

GEOPHYSICS®

VOL. 78, No. 6 | November-December 2013

DEPARTMENTS

Errata	Y7	Index to Volume 78	Z169
Geophysics Dissertation Abstracts	Z135	Professional Directory	*vi*
Intellectual Property	Z137	Postal Report	*ix*
Contributors	Z161		