

G37/3

GEOPHYSICS®



Society of Exploration Geophysicists
The international society of applied geophysics

VOL. 78, No. 3 | May-June 2013

EDITOR'S CORNER

This issue of *GEOPHYSICS*, *Tamas Nemeth, Editor*

1MJ

TECHNICAL PAPERS

GEOPHYSICS LETTERS

Taper design for block processing of seismic data, *Maïza Bekara*

A19

CASE HISTORIES

Combined surface and borehole seismic imaging in a hard rock terrain: A field test of seismic interferometry, *Charles Hurich and Sharon Deemer*

B103

Mineral Exploration using CSAMT data: Application to Longmen region metallogenic belt, Guangdong Province, China, *Xiangyun Hu, Ronghua Peng, Guiju Wu, Weiping Wang, Guangpu Huo, and Bo Han*

B111

Time-lapse magnetotelluric monitoring of an enhanced geothermal system,

Jared R. Peacock, Stephan Thiel, Graham S. Heinson, and Peter Reid

B121

Localizing CO₂ at Sleipner — Seismic images versus P-wave velocities from waveform inversion, *Manuel Queißefer and Satish C. Singh*

B131

Convolutional time-lapse seismic modeling for CO₂ sequestration at the Dickman oilfield, Ness County, Kansas, *Jintan Li, Christopher Liner, Po Geng, and Jianjun Zeng*

B147

ANISOTROPY

Noncontacting benchtop measurements of the elastic properties of shales,

Thomas E. Blum, Ludmila Adam, and Kasper van Wijk

C25

BOREHOLE GEOPHYSICS AND ROCK PROPERTIES

Evaluation of known-boundary and resistivity constraints for improving cross-borehole DC electrical resistivity imaging of discrete fractures, *Judith Robinson,*

Timothy Johnson, and Lee Slater

D115

Fracture parameter estimation from well-log data, *Samik Sil*

D129

The effect of confining pressure on elastic wave velocities and dynamic to static Young's modulus ratio, *Mohammad Reza Asef and Ali Reza Najibi*

D135

An approach for predicting stress-induced anisotropy around a borehole, *Xinding Fang, Michael Fehler, Zhenya Zhu, Tianrun Chen, Stephen Brown, Arthur Cheng, and M. Nafi Toksöz*

D143

Fast modeling of borehole neutron porosity measurements with a new spatial transport-diffusion approximation, *Olabode Ijasan, Carlos Torres-Verdín, and William E. Preeg*

D151

Characterization of elastic properties of near-surface and subsurface deepwater hydrate-bearing sediments, *Zijian Zhang, De-hua Han, and Daniel R. McConnell*

D169

ELECTRICAL AND ELECTROMAGNETIC METHODS

The use of wavelet transforms for improved interpretation of airborne transient electromagnetic data, *Vanessa Nenna and Adam Pidlisecky*

E117

Denoising multicomponent CSEM data with equivalent source processing techniques, *Kris MacLennan and Yaoguo Li*

E125

Electromagnetic interferometry in wavenumber and space domains in a layered earth, *Jürg Hunziker, Evert Slob, Yuanzhong Fan, Roel Snieder, and Kees Wapenaar*

E137

GEOFYSICS®

VOL. 78, No. 3 | May-June 2013

Continued from front cover

GRAVITY EXPLORATION METHODS

- Using isostatic gravity anomalies from spherical harmonic models and elastic plate compensation to interpret the lithosphere of the Bolivian Andes,**
Christopher Jekeli, Hyo Jin Yang, and Kevin Ahlgren **G41**
- Dynamics and navigation of autonomous underwater vehicles for submarine gravity surveying,**
James C. Kinsey, Maurice A. Tivey, and Dana R. Yoerger **G55**
- Forward modeling of gravity data using finite-volume and finite-element methods on unstructured grids,**
Hormoz Jahandari and Colin G. Farquharson **G69**

INTERDISCIPLINARY STUDIES

- Structure-coupled joint inversion of geophysical and hydrological data,**
Tobias Lochbühler, Joseph Doetsch, Ralf Brauchler, and Niklas Linde **ID1**

MAGNETIC EXPLORATION METHODS

- Deep-tow 3C magnetic measurement: Solutions for calibration and interpretation,**
Adrien Bronner, Marc Munsch, Daniel Sauter, Julie Carlut, Roger Searle, and Alexis Mainault **J15**
- Mitigating remanent magnetization effects in magnetic data using the normalized source strength,**
Mark Pilkington and Majid Beiki **J25**
- Enhancement of the total horizontal gradient of magnetic anomalies using the tilt angle,**
Francisco J. F. Ferreira, Jeferson de Souza, Alessandra de B. e S. Bongiolo, and Luís G. de Castro **J33**

MINING GEOPHYSICS

- Geometrical considerations in the acquisition of borehole interferometric data for imaging near-vertical features: Design of field experiments,**
Emma Brand, Charles Hurich, and Sharon Deemer **K1**

PASSIVE SEISMIC METHODS

- Analytic solutions to the joint estimation of microseismic event locations and effective velocity model,**
Emil Blas and Vladimir Grechka **KS51**

POROELASTICITY

- Estimating Brown-Korringa constants for fluid substitution in multimineralic rocks,**
Gary Mavko and Tapan Mukerji **L27**

RESERVOIR GEOPHYSICS

- Relaxation shift in rocks containing viscoelastic pore fluids,**
Gary Mavko **M19**

SEISMIC AMPLITUDE INTERPRETATION

- An analysis of AVO inversion for postcritical offsets in HTI media,**
Lyubov Skopintseva and Tariq Alkhalifah **N11**

SEISMIC INTERFEROMETRY

- Singular-value decomposition analysis of source illumination in seismic interferometry by multidimensional deconvolution,**
Shohei Minato, Toshifumi Matsuoka, and Takeshi Tsuji **Q25**

SEISMIC INVERSION

- A new optimization approach for source-encoding full-waveform inversion,**
Peyman P. Moghaddam, Henk Keers, Felix J. Herrmann, and Wim A. Mulder **R125**
- Robust estimation of primaries by sparse inversion via one-norm minimization,**
Tim T. Y. Lin and Felix J. Herrmann **R133**

GEOPHYSICS®

VOL. 78, No. 3 | May-June 2013

SEISMIC MIGRATION

- Migration velocity analysis using residual diffraction moveout in the poststack depth domain**, *Tiago A. Coimbra, J. Jadsom S. de Figueiredo, Jörg Schleicher, Amélia Novais, and Jessé C. Costa* S125
- Nonlinear scattering based imaging in elastic media: Theory, theorems, and imaging conditions**, *Matteo Ravasi and Andrew Curtis* S137
- Spatial sampling, migration aliasing, and migrated amplitudes**, *Samuel H. Gray* S157

SEISMIC MODELING AND WAVE PROPAGATION

- Application of Sobolev gradient techniques to two-point ray tracing**, *Matt Browning, George McMechan, and John Ferguson* T59
- Local time stepping with the discontinuous Galerkin method for wave propagation in 3D heterogeneous media**, *Sara Minisini, Elena Zhebel, Alexey Kononov, and Wim A. Mulder* T67

SIGNAL PROCESSING

- Noise reduction by vector median filtering**, *Yike Liu* V79
- Geophysical signal processing using sequential Bayesian techniques**, *Caglar Yardim, Peter Gerstoft, and Zoi-Heleni Michalopoulou* V87
- Double beamforming processing in a seismic prospecting context**, *Pierre Boué, Philippe Roux, Michel Campillo, and Benoit de Cacqueray* V101
- Dynamic estimation of reflectivity by minimum-delay seismic trace decomposition**, *Milton J. Porsani, Bjørn Ursin, and Michelângelo G. Silva* V109

TUTORIALS AND EXPOSITORY DISCUSSIONS

- The Backus-Gilbert method and their minimum-norm solution**, *Jose M. Pujol* W9

SPECIAL SECTION — ASSESSING UNCERTAINTY

- Assessing uncertainty in geophysical problems — Introduction**, *Aime Fournier, Klaus Mosegaard, Henning Omre, Malcolm Sambridge, and Luis Tenorio* WB1

TECHNICAL PAPERS

- Interpretation of self-potential anomaly over a 2D inclined structure using very fast simulated-annealing global optimization — An insight about ambiguity**, *Shashi Prakash Sharma and Arkoprovo Biswas* WB3
- Optimal nonlinear design of marine borehole seismic surveys**, *Darrell Coles, Yi Yang, Hugues Djikpesse, Michael Prange, and Konstantin Osypov* WB17
- The uncertainty in layered models from wide-angle seismic data**, *M. Majdański* WB31
- Uncertainty of linear earthquake site amplification via Bayesian inversion of surface seismic data**, *Sheri Molnar, Stan E. Dosso, and John F. Cassidy* WB37
- Transdimensional inversion of ambient seismic noise for 3D shear velocity structure of the Tasmanian crust**, *Mallory K. Young, Nicholas Rawlinson, and Thomas Bodin* WB49
- Transdimensional uncertainty estimation for dispersive seabed sediments**, *Jan Dettmer, Charles W. Holland, and Stan E. Dosso* WB63
- Global sensitivity analysis for crosswell seismic and neutron-capture measurements in CO₂ storage projects**, *Nikita Chugunov, Yusuf Bilgin Altundas, T. S. Ramakrishnan, and Ozgur Senel* WB77
- Transdimensional change-point modeling as a tool to investigate uncertainty in applied geophysical inference: An example using borehole geophysical logs**, *Anyia M. Reading and Kerry Gallagher* WB89

GEOPHYSICS®

VOL. 78, No. 3 | May-June 2013

Quantification of uncertainty in a multistage/multiparameter modeling workflow:

Pore pressure from geophysical well logs, *Stefan Wessling, Anne Bartzko, and Philipp Tesch*

WB101

The upside of uncertainty: Identification of lithology contact zones from airborne geophysics and satellite data using random forests and support vector machines, *Matthew J. Cracknell and Anya M. Reading*

WB113

DEPARTMENTS

Geophysics Dissertation Abstracts

Z53

Contributors

Z67

Intellectual Property

Z55

Professional Directory

vi