

DOUGLAS E. MILLER

Retired from a three decade career as a research scientist at Schlumberger's labs in Ridgefield CT, Cambridge UK and Cambridge MA, I am presently a Research Affiliate of the Department of Earth, Atmospheric and Planetary Sciences at MIT and Principal Scientist at Miller Applied Science, LLC. I welcome opportunities to collaborate on scientifically interesting data analysis or technology development projects in geophysics, ultrasonics, or remote sensing.

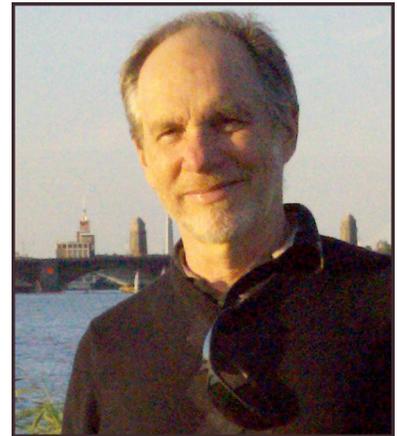
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EDUCATION:

Ph.D., Mathematics, University of California at Berkeley, 1976
M.A., Mathematics, University of California at Berkeley, 1974
B.A., Mathematics, Princeton University, 1971

EMPLOYMENT HISTORY:

Principal Scientist, Miller Applied Science, LLC
2011-present
Research Scientist/Scientific Advisor, Schlumberger
1981 – September 2010 (29 years)
Senior Research Scientist (on leave from Schlumberger), Witten Technologies,
June 2000 – November 2001 (1.5 years)
Assistant/Associate Professor of Mathematics, University of Illinois at Chicago
September 1977 – November 1981 (4.25 years)
Gibbs Instructor of Mathematics Yale University
July 1975 – August 1977 (2 years)

SELECTED PUBLICATIONS:

- [1] D. E. Miller, On the measurability of orbits in Borel actions, *Proc. Amer. Math. Soc.*, 63 (1977), pp. 165-170
- [2] D. Miller, M. Oristaglio, and G. Beylkin, A new slant on seismic imaging: classical migration and integral geometry. *Geophysics*, 52 (1987), pp. 943-964.
- [3] D. Miller and L. Dupal, Reef delineation by multiple offset borehole seismic profiles: a case study. *AAPG Study in Geology #27: Atlas of Seismic Stratigraphy*, A. Bally, ed., AAPG, (1987), pp. 110-116
- [4] D. Miller and C. H. Chapman, Incontrovertible evidence of anisotropy in crosswell data. *Extended abstracts of the 61st Annual Meeting of the SEG* (1991), 858-928
- [5] D. E. Miller, S. Leaney, and W. H. Borland, An in situ estimation of anisotropic elastic moduli for a submarine shale, *J. Geophys. Res.*, 99 (1994), pp. 21659-21665.
- [6] D. E. Miller and C. Spencer, An exact inversion for anisotropic moduli from phase slowness data, *J. Geophys. Res.*, 99 (1994), pp. 21651-21657.
- [7] C.H. Chapman and D.E. Miller, Velocity Sensitivity in TI Media, *Geophysical Prospecting*, 44 (1996), pp.525-549
- [8] R. Burrige, M. V. de Hoop, D. Miller, and C. Spencer, Multiparameter inversion in anisotropic media, *Geophys. J. Int.*, 134 (1998), pp. 757-777
- [9] D. Miller and F. Stanke, Method of analyzing waveforms (1999), US Patent 5859811
- [10] M. Oristaglio, D. Miller, and J. Haldorsen, Ground Probing Radar, in *Scattering: Scattering and Inverse Scattering in Pure and Applied Science*, E.R. Pike and P. Sabatier, eds., Academic Press, June 2001.
- [11] R. Birken, D. Miller, et al., Efficient large-scale underground utility mapping using a new multi-channel ground-penetrating imaging radar system, *Proceedings of the Second International Conference on the Application of Geophysical and NDT Methodologies to Transportation Facilities and Infrastructure*, Los Angeles, May 2002
- [12] J. Walsh, B. Sinha, T. Plona, D. Miller, and M. Ammerman, Derivation of anisotropy parameters in a shale using borehole sonic data, *SEG Abstracts* 26, 323 (2007)
- [13] D. Miller et al., Wireless Logging of Fluid Filled Boreholes (2008), US Patent Application 20080239872
- [14] C-W. Chen, D.E. Miller, H.A. Djikpesse, J.B.U. Haldorsen, and S. Rondenay, Array-conditioned deconvolution of multiple component teleseismic recordings, *Geophys. J. Int.*, 182 (2010), pp 967-976
- [15] D. Miller, et al., Microhydraulic Fracturing with Downhole Acoustic Measurement (2010), US Patent Application 20100157737
- [16] D. Miller, T. Parker, S. Kashikar, M. Todorov, and T. Bostick, Vertical Seismic Profiling Using a Fibre-optic Cable as a Distributed Acoustic Sensor, *EAGE* 2012

[17] D. Miller, S. Horne, and J. Walsh, Precise Inversion of Logged Slownesses for Elastic Parameters in a Gas Shale Formation, *Geophysics*, 77 (2012), no. 4, pp. B197-B206.

[18] D. Miller, R. Plumb, and G. Boitnott, Anisotropic static and dynamic moduli measured on shale plugs cut parallel to and perpendicular to bedding, *Geophysical Prospecting*, 61 (2013), pp 315-328 (IIWRP special issue)

[19] Daley, T.M., Miller, D.E., Dodds, K., Cook, P. and Freifeld, B.M. (2015), Field testing of modular borehole monitoring with simultaneous distributed acoustic sensing and geophone vertical seismic profiles at Citronelle, Alabama. *Geophysical Prospecting*. doi: 10.1111/1365-2478.12324

[20] D. E. Miller, T.M. Daley, D. White, B.M. Freifeld, M. Robertson, J. Cocker, M. Craven (2016), Simultaneous Acquisition of Distributed Acoustic Sensing VSP with Multi-mode and Singlemode Fibre Optic Cables and 3C-Geophones at the Aquistore CO2 Storage Site, CSEG Recorder (June 2016) pp. 28-33

[21] H. F. Wang, X. Zeng, D. E. Miller, D. Fratta, K. L. Feigl, C. H. Thurber, R. J. Mellors, Ground motion response to an ML 4.3 earthquake using co-located distributed acoustic sensing and seismometer arrays, *Geophysical Journal International*, Volume 213, Issue 3, 1 June 2018, Pages 2020–2036, <https://doi.org/10.1093/gji/ggy102>

[22] D. Miller, T. Coleman, X. Zeng, J. Patterson, E. Reinisch, H. Wang, D. Fratta, W. Trainor-Guitton, C. Thurber, M. Robertson, K. Feigl, and The PoroTomo Team (2018), DAS and DTS at Brady Hot Springs: Observations about Coupling and Coupled Interpretations, 43rd Stanford Workshop on Geothermal Reservoir Engineering (2018)

COMPREHENSIVE LIST OF PATENTS AND PUBLICATIONS

PATENTS AND PUBLISHED PATENT APPLICATIONS

Bennett, N. N. and Coates, R. T. and Haldorsen, J. B. U. and Miller, D. E., METHODS AND APPARATUS FOR DETERMINING SLOWNESS OF WAVEFRONTS, US Patent 9529109 (Dec 2016)

Wilson, C., Robertsson, J., Kragh, J. E., Muzyert, E., Welker, K. E., Miller, D., USING A DISTRIBUTED OPTICAL SENSOR TO POSITION AN OBJECT, US Patent Application 20120020184 (Jan 2012)

Kragh, E., Muzyert, E., Robertsson, J., Miller, D., Hartog, A., Seismic acquisition system including a distributed sensor having an optical fiber, US Patent 8924158B2 (Dec 2014)

Shampine, R., Sullivan, P., Miller, D., Guillot, D., Auzeais, F., and Coates, R., MECHANICAL TUBE WAVE SOURCES AND METHODS OF USE FOR LIQUID FILLED BOREHOLES, US Patent 9453404 (September 2016)

MacKay, B. A. and Sullivan, P. F. and Droger, N. and D'Angelo, R. M. and Miller, D. E., Method FOR TREATING WELL BORE WITHIN A SUBTERRANEAN FORMATION, US Patent 8215393 (July 2012)

Coates, R., Miller, D., Sullivan, P., Auzeais, F., Habashy, T., DETERMINATION OF DOWNHOLE PRESSURE WHILE PUMPING United States Patent 7874362 (Jan 2011)

Horne, S., and Miller, D., ESTIMATING SUBSURFACE ELASTIC PARAMETERS, US Patent Application 20100302903 (DECEMBER 2010)

Auzeais, F., Miller, D., Boney, C., Guillot, D., MONITORING, CONTROLLING AND ENHANCING PROCESSES WHILE STIMULATING A FLUID-FILLED BOREHOLE, United States Patent 7819188 (Oct 2010)

Horne, S., and Miller, D., ESTIMATING SUBSURFACE ELASTIC PARAMETERS, US Patent Application 20100302903 (December 2010)

Hartog, A., Miller, D., Kader, K., Lees, G., Hilton, G., Mullens, S., DISTRIBUTED ACOUSTIC WAVE DETECTION, US Patent Application 20100107754 (May 2010)

Miller, D. Latifzai, A., Prioul, R., Mackay, B., Mullins, O., Hausot, A., Wang, C., Farahani, A., MICROHYDRAULIC FRACTURING WITH DOWNHOLE ACOUSTIC MEASUREMENT, United States Patent Application 20100157737 (May 2010)

Shampine, R., Guillot, D., Miller, D., Flamant, N., Vigneaux, P., METHOD FOR MONITORING CEMENT PLUGS, WIPO Application WO/2010/060620 (March 2010)

Miller, D., Mullins, O., Zimmerman, T., Brennan, W., Harrison, C., D'angelo, R., Liang, K., Winkler, K., ACOUSTIC MEASUREMENTS WITH DOWNHOLE SAMPLING AND TESTING TOOLS, WIPO Application WO2009086279 (September 2009)

Haldorsen, J., Leaney, S., Miller, D., Coates, R., PROCESSING OF COMBINED SURFACE AND BOREHOLE SEISMIC DATA, United States Patent Application 20090097356 (April 2009)

Auzerais, F., Miller, D., Boney, C., Guillot, D., MONITORING, CONTROLLING AND ENHANCING PROCESSES WHILE STIMULATING A FLUID-FILLED BOREHOLE, United States Patent Application 20090159272 (June 2009)

Miller, D., Sullivan, P., Coates, R., Auzerais, F., Habashy, T., Guillot, D., Shampine, R., WIRELESS LOGGING OF FLUID FILLED BOREHOLES United States Patent Application 20080239872 (October 2008)

Coates, R., Miller, D., Sullivan, P., Auzerais, F., Habashy, T., DETERMINATION OF DOWNHOLE PRESSURE WHILE PUMPING United States Patent Application 20080236935 (October 2008)

Burns, M., Derubeis, A., Albats, P. Jr., Casadonte, R., Birken, R., Deming, R., Haldorsen, J., Hansen, T., Miller, D., Oristaglio, M., METHOD FOR MERGING POSITION INFORMATION WITH MEASUREMENTS AND FILTERING TO OBTAIN HIGH-QUALITY IMAGES THAT ARE POSITIONED ACCURATELY WITH RESPECT TO GLOBAL COORDINATES, United States Patent 6766253 (July 2004)

Albats, P. Jr., Burns, M., Dalton, M., Derubeis, A., Evans, C., Haldorsen, J., Hansen, T., Miller, D., Oristaglio, M., ROTATING SCANNING ANTENNA APPARATUS AND METHOD FOR LOCATING BURIED OBJECTS, United States Patent 6388629 (May 2002)

Miller, D., Stanke, F., METHOD OF ANALYZING WAVEFORMS, United States Patent 5859811 (January 1999)

Miller, D., METHOD OF DETERMINING EARTH ELASTIC PARAMETERS IN ANISOTROPIC MEDIA, United States Patent 5,737,220 (April 1998) ; GB Patent 9311696 (June 1993)

Miller, D., Haldorsen, J., and Kostov, C., METHODS FOR DECONVOLUTION OF UNKNOWN SOURCE SIGNATURES FROM UNKNOWN WAVEFORM DATA, United States Patent 4,922,362 (May 1990)

REFEREED PUBLICATIONS

H. F. Wang, X. Zeng, D. E. Miller, D. Fratta, K. L. Feigl, C. H. Thurber, R. J. Mellors, Ground motion response to an ML 4.3 earthquake using co-located distributed acoustic sensing and seismometer arrays, *Geophysical Journal International*, Volume 213, Issue 3, 1 June 2018, Pages 2020–2036, <https://doi.org/10.1093/gji/ggy102>

Jakob B. U. Haldorsen, Espen Stensrud, Ioan-Alexandru Merciu, and Douglas E. Miller (2016). "Decomposing full-waveform borehole acoustic data with application to data from a North Sea well." *GEOPHYSICS*, 81(4), IM71-IM95. doi: 10.1190/geo2015-0428.1

Jakob B. U. Haldorsen, Espen Stensrud, Ioan-Alexandru Merciu, and Douglas E. Miller (2016). "Characterizing borehole plumbing using full-waveform ultrasonic data: Application to data from a North Sea well." *GEOPHYSICS*, 81(6), B189-B199. doi: 10.1190/geo2015-0546.1

D. E. Miller, T.M. Daley, D. White, B.M. Freifeld, M. Robertson, J. Cocker, M. Craven (2016), Simultaneous Acquisition of Distributed Acoustic Sensing VSP with Multi-mode and Singlemode Fibre Optic Cables and 3C-Geophones at the Aquistore CO2 Storage Site, *CSEG Recorder* (June 2016) pp. 28-33

Daley, T.M., Miller, D.E., Dodds, K., Cook, P. and Freifeld, B.M. (2015), Field testing of modular borehole monitoring with simultaneous distributed acoustic sensing and geophone vertical seismic profiles at Citronelle, Alabama. *Geophysical Prospecting*. doi: 10.1111/1365-2478.12324

T. Daley, B. Freifeld, J. Ajo-Franklin, S. Dou, R. Pevzner, V. Shulakove, S. Kashikar, D. Miller, J. Goetz, S. Lueth, [Field testing of fiber-optic distributed acoustic sensing \(DAS\) for subsurface seismic monitoring](#), *The Leading Edge*, June 2013, pp. 936-942

D. Miller, R. Plumb, and G. Boitnott, Anisotropic static and dynamic moduli measured on shale plugs cut parallel to and perpendicular to bedding, *Geophysical Prospecting*, 61 (2013), pp 315-328 (IIWRP special issue)

D. Miller, S. Horne, and J. Walsh, Precise Inversion of Logged Slownesses for Elastic Parameters in a Gas Shale Formation, *Geophysics*, 77 (2012), no. 4, pp. B197-B206.

Horne, S. A., J. Walsh and D. Miller, Elastic anisotropy in the Haynesville Shale from dipole sonic data, *First Break*, 30 (2012), no.2, 37-41.

Chen, C-W., Miller, D., Djikpesse, H., Haldorsen, J., and Rondenay, S., Array-conditioned deconvolution of multiple component teleseismic recordings, *Geophys. J. Int.*, vol 182 (2010), pp 967-976

Djikpesse, H., Dong, S., Haldorsen, J., Miller, D., Comparing interferometric migration and mirror imaging of 3D VSP free-surface multiples: in *Noise and Diffuse Wavefields*:

DGG-Mitteilungen, German Geophysical Society Eds.,(2009), pp. 79-86, ISBN 978-3-00-027952-2

Oristaglio, M., Miller, D. and Haldorsen, J., Ground Probing Radar, invited chapter in *Scattering: Scattering and Inverse Scattering in Pure and Applied Science*, E.R. Pike and P. Sabatier, eds., Academic Press (2001)

Bernstein, R., Oristaglio, M., Miller, D.E., and Haldorsen, J., Imaging Radar Maps Underground Objects in 3D, *IEEE Computer Applications in Power* (July 2000), pp. 20-24

Leaney, S., Sayers, C., and Miller, D., 1999, Analysis of multiazimuthal VSP data for anisotropy and AVO: *Geophysics*, 64 (1999) 1172-1180

Chapman, C.H. and Miller, D.E., Velocity Sensitivity in TI Media, *Geophysical Prospecting*, 44 (1996), pp.525-549

Burridge, R., de Hoop, M., Miller, D., and Spencer, C., Multiparameter inversion in anisotropic media, *Geophys. J. Int.*, 134 (1998), pp. 757-777

Haldorsen, J., Miller, D., and Walsh, J., Walkaway VSP Using Drill-Noise as a Source, *Geophysics*, v. 60 (1995), pp. 978-997

de Hoop, M., Burridge, R., Spencer, C. and Miller, D., Generalized Radon Transform/Amplitude Versus Angle (GRT/AVA) migration/inversion in anisotropic media, in: *Mathematical Methods in Geophysical Imaging II*, S. Hassenzadeh, ed., SPIE Vol. 2301, 15-27 (1994)

Miller, D. E., Leaney, S. and Borland, W. H., An in situ estimation of anisotropic elastic moduli for a submarine shale, *J. Geophys. Res.*, 99 (1994) 21,659-21,665

Miller, D.E., and Spencer, C., An exact inversion for anisotropic moduli from phase slowness data, *J. Geophys. Res.*, 99 (1994), 21,651-21,657

J.Haldorsen, D.Miller, J.Walsh, Multichannel Wiener Deconvolution of Vertical Seismic Profiles, *Geophysics*, 59 (1994), p. 1500-1511. Reprinted in *Deconvolution 2*, ed. Robinson, E., and Osman, O., Geophysics Reprint Series, Society of Exploration Geophysicists (1996)

Miller, D., and Burridge, R., Multiparameter inversion, dip-moveout, and the generalized Radon transform, *Proceedings of SIAM Workshop on Geophysical Inversion*, J. B. Bednar, ed. (1989) ISBN ISBN 0-89871-273-4

Esmersoy, C. and Miller, D., Backprojection vs. backpropagation in multidimensional linearized inversion. *Geophysics*, 54 (1989), pp. 921-926

- Jakubowicz, H., and Miller, D., Two-pass 3D migration and linearized inversion in the (x,t) domain. *Geophysical Prospecting*, 37 (1989), pp. 143-148
- Miller, D., Oristaglio, M., and Beylkin, G., A new slant on seismic imaging: classical migration and integral geometry. *Geophysics*, 52 (1987), pp. 943-964
- Beylkin, G., Oristaglio, M., and Miller, D., Spatial Resolution of Migration Algorithms, *Acoustical Imaging, V. 14*, ed. By A. J. Berkhout, J. Ridder, & L. F. van der Wal, Plenum (1985) p 155-168
- Miller, D., and Dupal, L., Reef delineation by multiple offset borehole seismic profiles: a case study. In *AAPG Study in Geology #27: Atlas of Seismic Stratigraphy*, A. Bally, ed., AAPG, 1987, pp. 110-116.
- Miller, D.E., Index sets and Boolean operations, *Proc. Amer. Math. Soc.*, 84 (1982), pp. 568-572
- Hay, L. and Miller, D.E., A topological analog to the Rice-Shapiro index theorem, *Jour. Symbolic Logic*, 47 (1982), pp. 824-832
- Baldwin, J. and Miller, D.E., Some contributions to definability theory for languages with generalized quantifiers, *Jour. Symbolic Logic*, 47 (1982), pp. 572-586
- Hay, L. and Miller, D.E., The Addison game played backwards: Index sets in topology, *Proc A.S.L. Summer Logic Meeting at Patras, Aug. 1980*
- Miller, D.E., The metamathematics of model theory: Discovering language in action, *Jour. Symbolic Logic*, 46 (1981), pp. 490-498
- Miller, D.E., Borel selectors for separated quotients, *Pacific Jour. Math.*, 91 (1980), pp. 187-198
- Miller, D.E., On classes closed under unions of chains, *Jour. Symbolic Logic*, 44 (1979), pp. 29-31
- Miller, D.E., Some applications of invariant sets to the theory of definability, *Jour. Symbolic Logic*, 44 (1979), pp. 9-14
- Miller, D.E., A selector for equivalence relations with G-delta orbits, *Proc. Amer. Math. Soc.*, 72 (1978), pp. 365-369
- Miller, D.E., The invariant pi-zero-alpha separation principle, *Trans. Amer. Math. Soc.*, 242 (1978), pp. 185-204
- Miller, D.E., On the measurability of orbits in Borel actions, *Proc. Amer. Math. Soc.*, 63 (1977), pp. 165-170

Burgess, J., and Miller, D.E., Remarks on invariant descriptive set theory, *Fundamenta Mathematica*, 90 (1975), pp. 53-75

OTHER PUBLICATIONS

D. Miller, T. Coleman, X. Zeng, J. Patterson, E. Reinisch, H. Wang, D. Fratta, W. Trainor-Guitton, C. Thurber, M. Robertson, K. Feigl, and The PoroTomo Team (2018), DAS and DTS at Brady Hot Springs: Observations about Coupling and Coupled Interpretations, 43rd Stanford Workshop on Geothermal Reservoir Engineering (2018)

Hull, R., Meek, R., Bello, H., & Miller, D. (2017, July 24). Case History of DAS Fiber-Based Microseismic and Strain Data, Monitoring Horizontal Hydraulic Stimulations Using Various Tools to Highlight Physical Deformation Processes (Part A). Unconventional Resources Technology Conference. urtec-2017-2695282

M. Cardiff, X. Zeng, N. Lord, C. Lancelle, D. Lim, L. Parker, E. Reinisch, S. T. Ali, D. Fratta, C. Thurber, H. Wang, M. Robertson, T. Coleman, D. Miller, J. Lopeman, P. Spielman, J. Akerley, C. Kreemer, C. Morency, E. Matzel, W. Trainor-Guitton, S. Jreij, N. Davatzes (2017), Overview and Preliminary Results from the PoroTomo project at Brady Hot Springs, Nevada: Poroelastic Tomography by Adjoint Inverse Modeling of Data from Seismology, Geodesy, and Hydrology, 42nd Stanford Workshop on Geothermal Reservoir Engineering (2017)

D. Miller, T. Parker, S. Kashikar, M. Todorov, and T. Bostick, Vertical Seismic Profiling Using a Fibre-optic Cable as a Distributed Acoustic Sensor, (2012) EAGE Expanded Abstracts, Copenhagen, Y004

D. Miller, S. Horne, and J. Walsh, Precise Inversion of Logged Slownesses for Elastic Parameters in a Gas Shale Formation, *1st International Workshop on Rock Physics*, Colorado School of Mines, August 11, 2011

D. Miller, R. Plumb, and G. Boitnott, Anisotropic static and dynamic moduli measured on shale plugs cut parallel to and perpendicular to bedding, *1st International Workshop on Rock Physics*, Colorado School of Mines, August 11, 2011

Walsh, J.J., Sinha, B.K., Plona, T.J., Miller, D.E., and Ammerman, M., Derivation of anisotropy parameters in a shale using borehole sonic data, *SEG Expanded Abstracts* 26, 323 (2007) and *42nd U.S. Rock Mechanics Symposium (USRMS)*, June 29 - July 2, 2008, San Francisco, CA

Taylor, S., Miller, D.E., Haldorsen, J.B.U., Coates, R. Interferometric deconvolution of VSP data (2007) *SEG Technical Program Expanded Abstracts*

Coates, Richard and Haldorsen, Jakob B. U. and Miller, Douglas and Malin, Peter and Shalev, Eylon and Taylor, Stewart T. and Stolte, Christian and Verliac, Michel, Oilfield technologies for earthquake science, *Oilfield Review* (2006), 24 - 33

Van Kuijk, R., Zeroug, S., Froelich, B., Allouche, M., Bose, S., Miller, D., Le Calvez, J.L., Schoepf, V., Pagnin, A.: A Novel Ultrasonic Cased-Hole Imager for Enhanced Cement Evaluation paper *SPE 10546* presented at the International Petroleum Technology Conference Doha, Qatar (November 21-23, 2005)

Taylor, S. T.; Miller, D.; Haldorsen, J. B.; Coates, R.; Malin, P.; Shalev, E., P-wave and s-wave imaging from drill bit seismic data at SAFOD, *American Geophysical Union, Fall Meeting 2005*

Birken, R., Miller, D., Burns, M., Albats, P., Casadonte, R., Deming, R., Derubeis, T., Hansen, T., and Oristaglio, M., Efficient Large-Scale Underground Utility Mapping with a Multi-Channel Ground-Penetrating Imaging Radar System, *SAGEEP Proceedings* (2002)

Haldorsen, J., and Miller, D., Expedition Adventure Part 2: Higher Resolution Range Seismic Imaging to Locate a Sunken Pirate Ship off Ile St Marie, *SAGEEP Proceedings*, 2002

Bernstein, R. Oristaglio, M. Miller, D.E. Haldorsen, Imaging radar maps underground objects in 3-D, *J. Electr. Power Res. Inst., Palo Alto, CA*, 13, Issue: 3 (Jul 2000)

Haldorsen, J. B. U., Gilbert, F., Miller, D. E., and Pellerin, L., Verification of subsurface pollution barriers using ground-penetrating radar, *European Association of Geoscientists and Engineers, 60th EAGE Conference and Technical Exhibition*, Leipzig, 1998.

Haldorsen, J. B.U., Miller, D. E., and Gilbert, F., Imaging structures under steel-reinforced concrete floor, *European Association of Geoscientists and Engineers, 60th EAGE Conference and Technical Exhibition*, Leipzig, 1998.

J. B. U. Haldorsen, D. E. Miller, Feasibility of ground penetrating radars (GPR) for imaging subsurface structures, *Progress in Electromagnetics Research Symposium, Cambridge MA*, 1997.

Leaney, W.S., Miller, D.E. and Sayers, C.M., 1995, Fracture induced anisotropy and multi-azimuthal walkaways, *3rd SEGJ / SEG International Symposium*, November 8-10, Tokyo, p. 424-432.

Hornby, Brian E., Miller, Douglas E., and Esmersoy, Cengiz, Ultrasonic-to-seismic measurements of shale anisotropy in a NorthSea well, *Extended abstracts of the 65th Annual Meeting of the SEG*, 17-21. (1995)

De Hoop, M. V., Burrige, R., Spencer, C., & Miller, D. Generalized Radon transform amplitude versus angle (GRT/AVA) migration/inversion in anisotropic media. *SPIE (San Diego CA)* 2301 (1994)

Armstrong, P., D. Ireson, B. Chmela, K. Dodds, C. Esmersoy, D. Miller, B. Hornby, C. Sayers, M. Schoenberg, S. Leaney, and H. Lynn, The promise of elastic anisotropy: *Oilfield Review*, 6, (1994), 36–47.

Miller D. E., Leaney, S., Borland, B., 1993. An *in situ* estimation of anisotropic elastic moduli for a submarine shale, *expanded abstract, EAEG annual meeting, Stavanger*, (1993)

J. Haldorsen, J. Walsh, D. Miller, and H.-J. Zoch, Optimal Array-Focusing Deconvolution for VSP, *expanded abstract, EAEG annual meeting, Stavanger*, (1993)

R. Meehan, D. Miller, J. Haldorsen, M. Kamata, B. Underhill, Rekindling Interest in Seismic While Drilling, *Oilfield Review* 5, (January 1993), 4-13

J. Haldorsen, D. Miller, J. Walsh, H.-J. Zoch, Multichannel Approach to Signature Estimation and Deconvolution for Drill Bit Imaging *Extended abstracts of the 62nd Annual Meeting of the SEG, New Orleans, 1992*, pp.181-184

Miller, D. and Costa, C. Inversion for the Devine Anisotropic Medium *expanded abstract, EAEG annual meeting, Paris*, (1992), pp 88-89

Miller, D., & Chapman, C. H., 1991. Incontrovertible evidence of anisotropy in crosswell data *Extended abstracts of the 61st Annual Meeting of the SEG*, (1991) 858-928

Miller, D., and Stewart, L., Reservoir imaging using VSP-derived velocities: A case study. *Extended abstract presented at 1988 SEG meeting in Anaheim*. Also presented at *SEG summer workshop in July 1988*

Esmersoy, C. and Miller, D., Stacking vs. Backpropagation in seismic imaging: Duality for multidimensional linearized inversion. *Extended abstract presented at SEG annual meeting, New Orleans, October, 1987*

Oristaglio, M., Miller, D., and Beylkin, G., The generalized Radon transform: a breakthrough in seismic migration, *The Technical Review*, 35 (1987) pp. 20-28

Dupal, L., and Miller, D., Reef delineation by multiple offset borehole seismic profiles: a case study. *Extended abstract SEG annual meeting*, (October, 1985)

Dangerfield, R., Christie, C., and Miller, D., Image reconstruction from borehole seismic data: a case study, *Presented at EAEG '85*

Beylkin, G., Oristaglio, M., and Miller, D., Spatial Resolution of Migration Algorithms, *Presented at Imaging Symposium at The Hague* (April 1985)

Miller, D.E., Oristaglio, M., and Beylkin, G., A new formalism and an old heuristic for seismic migration, *Extended abstract presented at SEG annual meeting, (November, 1984)*

Miller, D.E., Arrival times and envelopes: inverse modeling for subsurface seismics, *Technical Program, 53rd Mtg. SEG (1983)*, pp. 449-450

Baldwin, J. and Miller, D.E., Remarks on stationary logic (abstract), *Abstr. Amer. Math. Soc.* (1979)

Miller, D.E., Remarks on the quantifier There exist uncountably many (abstract), *Abstr. Amer. Math. Soc.* (1979)

Miller, D.E., Discovering language in action (abstract), *Jour. Symbolic Logic*, 43 (1978), pp. 366-367

Miller, D.E., Borel selectors for separated quotients (abstract), *Abstr. Amer. Math. Soc.* (1978)

Miller, D.E., On classes closed under unions of chains (abstract), *Abstr. Amer. Math. Soc.* (1977)

Miller, D.E., Some applications of invariant sets to the theory of definability (abstract), *Notices Amer Math. Soc.* (1976)

Miller, D.E., A selector for equivalence relations with G-delta orbits, (abstract), *Notices Amer. Math. Soc.* (1976)

Miller, D.E., The invariant pi-zero-alpha separation principle in topology and logic (abstract), *Notices Amer. Math. Soc.* (1975)

Miller, D.E., On the measurability of orbits in Borel actions (abstract), *Notices Amer. Math. Soc.* (1975)

Burgess, J., and Miller, D.E., Invariant reduction and uniformization in the projective and analytical hierarchies (abstract), *Notices Amer. Math. Soc.* (1975)

Miller, D.E., Remarks on the transform $B^* = \{ x : \{ g : gx \text{ belongs to } B \} \text{ is comeager} \}$ (abstract), *Notices Amer. Math. Soc.* (1975)

PH.D. DISSERTATION

Invariant descriptive set theory and the topological approach to model theory, Dept of Mathematics, Univ. of Calif. At Berkeley, 1976 (supervised by R.L. Vaught)

INVITED TALKS

Anecdotes about Anisotropy, Workshop in honor of Chris Chapman's retirement, Cambridge UK, 2007.

Integral Operators and Exploding Reflectors: Geometric Semantics for Migration/Inversion, MIT/Schlumberger Workshop on Geophysical Inversion, January, 2005

Multiparameter inversion, dip-moveout, and the generalized Radon transform, SIAM conference on geophysical inversion, Houston, September, 1989.

Reservoir imaging using VSP-derived velocities: a case study, Geophysical Society of Oklahoma City continuing education program, February, 1989.

The resolution of borehole reflection seismics, SEG crosswell workshop introductory talk, Los Alamos, NM, March 1988.

VSP: promises and pitfalls, Continuing education program of Dallas Geophysical and Geological societies, January, 1986.

Discovering language in action. Fifth Meeting of the Midwest Model Theory Seminar, Chicago, Il. November 1979.

Equivalence relations with G -delta orbits. London Mathematical Society Conference on Analytical Sets, London, July 1978.

The topological approach to model theory. 1977-78 Annual Meeting of the Association for Symbolic Logic, Washington, D.C., December 1977.

PH. D. COMMITTEES

Chin-Wu Chen, MIT, 2009

Jesse Costa, Federal University of Para, Brazil, 1993

Philippe Herrmann, Tech. Univ., Delft, 1992