

Chester J Weiss

Curriculum Vitae — March 2018

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Biographical Sketch

Dr. Weiss (PhD, 1998, Geophysics, Texas A&M) is a recognized leader in computational geophysics, with a strong emphasis on electromagnetic methods. Now back at Sandia National Laboratories and recently promoted by Special Appointment to Distinguished Member of the Technical Staff (adjunct appointment at University of New Mexico, Department of Earth and Planetary Sciences), he previously held positions at Virginia Tech (Associate Professor of Geophysics), BP (Scholar in Residence), Scripps Institution of Oceanography (Greens Fellow) and Cambridge University (Visiting Scientist). He is author of 38 peer reviewed papers and reports (1153 citations), an invited book chapter on magnetotellurics (Jones and Chave, Cambridge Univ. Press, 2012), and 88 national and international conference abstracts/presentations – one of which was recognized as a “Top 30” presentation of the Society of Exploration Geophysicists 2015 Annual Meeting. He has actively mentored/advised students throughout his career at Sandia and Virginia Tech, who now apply their knowledge of electromagnetics toward successful careers in academia, government laboratories and the energy industry. He has chaired/convened over a dozen special sessions at the annual meetings of the American Geophysical Union and the Society of Exploration Geophysicists on topics ranging from whole-earth electromagnetics to borehole anisotropy to fractional calculus and multi-scale transport. His early-career work in three-dimensional numerical modeling of electrical anisotropy (Weiss and Newman, 2002; 2003) is among the most highly cited literature on the topic. His novel visualization of the complex electric current patterns within such media resulted in a cover article in *Petrophysics* (Weiss et al., 2001) and quantitatively dispelled many of the prevailing qualitative assumptions. Having since worked on marine CSEM problems (Constable and Weiss, 2006; Weiss, 2007), whole-Earth electromagnetic induction (Weiss, 2010; Weiss and King, 2012; Kelbert et al., 2014; Weiss, 2014) and electromagnetic interferometry (Shamsalsadati and Weiss, 2010; 2012; 2014; Slob and Weiss, 2011), his recent work has focused on finite element analysis – a return to his roots as a young graduate student – where he has developed real-time modeling solutions to computationally explosive problems in oilfield geophysics. His expertise is sought across Sandia, industry and academe to solve problems in subsurface imaging, optimization, forward modeling of electromagnetic phenomena and analysis of electromagnetic data. He is a member of American Geophysical Union, Society of Exploration Geophysicists and was elected Fellow of the Royal Astronomical Society in 2002. He was Assistant Editor for *Geophysical Prospecting* (2003-09) and is now Assistant Editor (2009-11, 2016-present) and frequent reviewer for *Geophysics* on the topics of electromagnetics, numerical modeling and fracture characterization. When not working, he pursues his lifelong passion for outdoor sports – cycling, running and skiing – and spending time with his wife and twin three-year-old boys.

- Education:** B.Sc.(1992), Physics, Univ. of Arizona, USA
 Ph.D.(Dec. 1998), Geophysics, Texas A&M University, USA, (M. Everett, advisor)
 Thesis: Regularized Inversion of the Global Geomagnetic Observatory
 Dataset for Upper Mantle Electrical Conductivity.
- Honors:** 2015 “Top 30 Paper” Award, Society of Exploration Geophysicists Annual Meeting
 2015 Sandia National Laboratories, Employee (Team) Recognition Award
 2013 Virginia Tech College of Science, Scholar of the Week (April 15)
 2012 Nominated Candidate for President Elect for AGU Near Surface Focus Group
 2005 Sandia National Laboratories Award for Excellence
 2004 Heiland Distinguished Lecturer, Colorado School of Mines,
 Dept. of Geophysics
 2002–2003 Cecil and Ida Green Fellow, Scripps Inst. Oceanography,
 Institute of Geophysics and Planetary Physics, UC San Diego
- Experience:** 2018— Distinguished Member of the Technical Staff (Special Appointment)
 Geophysics Department, Sandia National Laboratories
 2014–2018 Principal R&D Staff Member, Geophysics Department
 Sandia National Laboratories
 2014— Adjunct Associate Professor of Geophysics
 Earth and Planetary Sciences Dept., Univ. of New Mexico
 2007–2014 Associate Professor of Geophysics, Dept., of Geosciences
 Virginia Polytechnic Institute and State University
 2007 Scholar in Residence, BP-America, Houston TX
 2006–2007 Geophysicist, Principal Member of the Technical Staff
 Sandia National Laboratories
 2000–2006 Geophysicist, Senior Member of the Technical Staff
 Sandia National Laboratories
 2003–2004 Member of scientific party, 3 cruises (approx. 7 weeks) using
 electromagnetic methods for sub-seafloor imaging: Gulf of
 Mexico, East Pacific Rise, Hydrate Ridge
 2002 Visiting Scientist, Scripps Institution of Oceanography
 1999–2000 Postdoctoral Appointee, Sandia National Laboratories
 Geophysical Technology Department, Albuquerque NM
 1997 Visiting Scientist, University of Cambridge, UK
 Institute for Theoretical Geophysics

Research Interests

The physics of electromagnetic phenomena in geologic materials and systems.

Investigation of the physiochemical state of Earth’s deep interior

Novel applications of geophysical methods for characterization of near-surface processes

Computational methods and visualization in the geosciences

Epistemology and the philosophy of science

Teaching, Advising and Mentoring

- 2017 SNL Student Intern Mentor: Andrea Darrh, Texas A&M University
 2016–7 SNL Student Intern Mentor: Christine Downs (McNiff), Univ. of South Florida
 2015 External PhD examiner: Hormoz Jahandari, Memorial University, Newfoundland CA
 2015 External PhD committee member: Christine McNiff (Univ. South Florida)
 Didem Beskardes (Virginia Tech)
- 2011 Awarded ‘Master Online Instructor’ Certification by Virginia Tech
 2011 Global Gravity and Geodesy (GEOS 6104), co-taught with S. King
 2010 Deep Earth Geophysics (GEOS 6104)
- 2008–2014 Graduate Student Advisor, Virginia Tech: Eric Kazlauskas (MS 2010),
 Sam Fortson (MS 2012), Sharmin Shamsalsadati (PhD 2013),
 Josh Whitney (MS 2009), Michael Cangliosi (MS 2012)
 Guiju Wu (Visiting PhD student, China Univ. of Geosciences, 2010)
- 2009 Undergraduate Research Advisor, Justin (Cable) Warren, (Spring 2009)
 2007/9 Potential Fields Methods, Virginia Tech (GEOS 4164)
 2008/9 Electromagnetic Meth. in Geophys., Virginia Tech (GEOS 4984/6104)
 2009–2014 Introduction to Geophysics, Virginia Tech (GEOS 3104)
 2004 Summer Geophysical Field Camp, Colorado School of Mines
 2002 Short Course, Numerical Methods in Geophysics, Scripps
 2000–2004 Student research supervisor, Sandia N.L. Intern Program
 Trish Gregg, U Missouri–Rolla (BS), now Woods Hole (PhD)
 Nancy Natek, New Mexico Tech. (MS)

Professional Activities

- member American Geophysical Union (AGU)
 member Society for Exploration Geophysicists (SEG), elected ‘active’ status 2007
 fellow Royal Astronomical Society (RAS), elected 2002
 associate editor, *Geophysical Prospecting* (2003–9), *Geophysics* (2009 – 2011)
 originator OpenEM.org – an online virtual institute for discussion and the dissemination of
 electromagnetic expertise to the broader geoscience community (with A Schultz, OSU)
 launched Fall 2009, now with 500+ registered users.
- member USArray Advisory Committee *and* IRIS Electromagnetic Working Group
 executive committee member, AGU Near Surface Focus Group, 2007–2013
 program committee representative, AGU Near Surface Focus Group, 2007–2013
 panel member, NASA Mars MDAP proposal review (2008)
 panel member, NASA Suborbital Program proposal review (2010)
 reviewer *National Science Foundation: EarthScope Program, Instrumentation
 and Facilities Program, Marine Geology and Geophysics Program*
 reviewer *Geophysics, Geophysical Journal International,
 Geophysical Research Letters, Computers in Geosciences
 and Pure and Applied Geophysics, J. of Computational Physics*
- co-chair Special sessions on near–surface geophysics
AGU Spring Meeting 2006, Fall Meeting 2007, 2008, 2009, 2010, JA 2009, 2016
- co-chair Special sessions on multi-physics investigations of lower mantle
Fall Meeting 2010
- co-chair Special sessions on fractional calculus in the geosciences
Fall Meeting 2010
- co-convenor Special session on borehole geophysics and electromagnetics
SEG Annual Meetings 2002, 2003, 2005
- co-chair Special sessions on global/crustal scale electromagnetics
AGU Fall Meetings, 1999 and 2000
- expert panel member (invited), DOE workshop on permeable
 reactive barriers (2002)

Recent Projects (funding levels disclosed where permissible)

- [1] Fully 3D finite element modeling and inversion of low-frequency electromagnetic fields for subsurface characterization and sharp boundary identification *Source: Sandia National Laboratories, LDRD program, 2004-5, Role: PI.*
- [2] Mapping gas reservoirs using seafloor EM methods, with S. Constable (Scripps Institution of Oceanography) *Source: Gas Technology Institute RPSEA program, 2003-4, Role: Sandia point of contact (PI: Constable).*
- [3] Mapping fluids in geothermal reservoirs using magnetotelluric methods *Source: United States Dept. of Energy Geothermal Program, 2003-4, Role: Sandia Technical Lead.*
- [4] Electromagnetic inference of geologic controls on groundwater distribution, flow, and recharge in the Estancia Basin, east central New Mexico. *Source: Sandia Nat. Labs Small Business Assistance Prog., 2005-6, Role: Principal Investigator.*
- [5] Research Opportunities for Undergraduates in Computational Geophysics *Source: BP High Performance Computing Center, Houston TX, \$25k fully loaded for 2008, Role: PI.*
- [6] Geologic and tectonic controls on the emplacement of uranium-rich mineralization at Coles Hill, South-central Virginia, *Source: Virginia Uranium Co., \$660k for 2008-9, Role: Co-PI. (funded MS graduate student J Whitney).*
- [7] MRI-R2/Acq: Heterogeneous Supercomputing Instrument for Transformative Interdisciplinary Research, *Source: United States National Science Foundation, Major Research Instrumentation Program, \$1.9M for 2010, (EAR 0960081) Role: Senior Researcher (PI's King, Feng and Hilu, Virginia Tech).*
- [8] Collaborative Research: Electromagnetic Induction in Geological Formations: A Careful Evaluation of the Subdiffusion Perspective, *Source: United States National Science Foundation, Hydrologic Science Program, \$175k (VT) + \$ 151k (TAMU) for 2010-15, (EAR 0943598 VT + EAR 0943589 TAMU) Role: PI with M. Everett, Texas A&M University. STATUS: expired, transferred to UNM in 2014*
- [9] CSEDI: Coupled Electromagnetic and Geodynamic Study of Thermochemical Piles, *Source: United States National Science Foundation, CSEDI Program, \$290k for 2010-15, (EAR 0968923) Role: PI, STATUS: expired, transferred to UNM in 2014*
- [10] Operational Sensitivity of “Through the Earth” Communication Systems for Mine Safety, *Source: The Alpha Foundation, \$600k for 2014-16, Role: Co-PI with S. Schafrik, Virginia Tech. STATUS: expired, transferred to UNM in 2014*
- [11] Modeling and Prediction of Anomalous Diffusion in Multi-scale Geologic Systems, *Source: Sandia National Laboratories, LDRD Program, 2017-19, Role: PI. STATUS: active*
- [12] Electromagnetic Methods for Proppant Detection During Hydrofracture, *Cooperative Research and Development Agreement (CRADA) with Oil Industry Partner, Role: Principal Geophysicist, 2014-16; PI 2016-17. STATUS: project active, but stepped down from PI duties in May 2017*
- [13] WISE CASING: Wellbore Integrity assessment with Casing-based Advanced sensing, *Source: US Department of Energy SubTER program, 2017-2018, Role: co-PI. STATUS: active*

Citation Analysis:

	All*	Since 2013*
Citations	1164	650
<i>h</i> -index	15	11
<i>i</i> 10-index	18	14

*Top cited EM paper in Geophysics from the period 2005-2010***

*4th most cited paper overall in Geophysics from the period 2005-2010***

Constable S and **C J Weiss**, Mapping thin resistors with marine EM methods: Insights from 1D modeling, *Geophysics*, **71**, G43–G51, 2006. [265 citations]

* Google Scholar, Jan 31 2018

** ISI Web of Knowledge and Scopus, August 1, 2010, in D Clark, The best papers published in Geophysics (by the numbers), *Geophysics*, **75**, A275-96 (2010).

Peer-Reviewed Papers:

+ denotes student coauthorship

- [1] Sager W W, **C J Weiss**, M A Tivey, and H P Johnson, Geomagnetic polarity reversal model of deep-tow profiles from the Pacific Jurassic ‘quiet zone’, *Journal of Geophysical Research*, **103**, 5269–5286, 1998.
- [2] **Weiss C J** and M E Everett, Geomagnetic induction in a heterogeneous sphere: Fully 3D test computations and the response of a realistic distribution of oceans and continents, *Geophysical Journal International* **135**, 650–662, 1998.
- [3]⁺ **Weiss C J**, X Lu and D L Alumbaugh, Visualization of eddy currents in an electrically anisotropic formation, *Petrophysics*, **42**, 580–587, 2001.
- [4] Badea E A, M E Everett, L C Shen and **C J Weiss**, Effect of background fields on 3-D induction logging computations, *Radio Science*, **36**, 721–729, 2001.
- [5] Everett M E, E A Badea E A, L Shen, G Merchant and **C J Weiss**, 3–D finite element analysis of induction logging in a dipping formation, *IEEE Transactions on Geoscience and Remote Sensing*, **39**, 2244–2252, 2001.
- [6] Everett M E and **C J Weiss**, Geological noise in near–surface electromagnetic induction data, *Geophysical Research Letters*, **29**, 10.1029/2001GL014049, 2002.
- [7] **Weiss C J** and T W H Caffey, Evaluation of a continuous–wave, borehole ground–penetrating radar, *Sandia National Laboratories, SAND Report*, SAND2002-2062 (2002).
- [8] Cygan R T, C K Ho and **C J Weiss**, Linking the geosciences to emerging bio–engineering technologies, *Sandia National Laboratories, SAND Report*, SAND2002-3690 (2002).
- [9]⁺ Lu X, D L Alumbaugh and **C J Weiss**, On the electric fields and currents produced by induction logging instruments in anisotropic media, *Geophysics*, **67**, 478–483, 2002.

- [10] **Weiss C J** and G A Newman, Electromagnetic induction in a fully 3D anisotropic Earth, *Geophysics*, **67**, 1104–1114, 2002.
- [11]⁺ Natek N H, **C J Weiss** and H Tobin, A perturbation expansion approach to solving the electromagnetic induction problem in three dimensions, *Sandia National Laboratories, SAND Report*, SAND2003-3161 (2003).
- [12] **Weiss C J** and G A Newman, Electromagnetic induction in a generalized 3D anisotropic Earth, Part II: The LIN preconditioner, *Geophysics*, **68**, 922–930, 2003.
- [13] Day D M, P B Bochev, K Pendley, **C J Weiss** and A C Robinson, Geophysical subsurface imaging and interface identification, *Sandia National Laboratories, SAND Report*, SAND2005-6273 (2005).
- [14] Cooper S P, G J Elbring, B E Jakabowski, J C Lorenz, S S Mani, R A Normann, M J Rightley, B van Bloemen Waanders, **C J Weiss**, L W Lake, B Gilbert, J Jennings, C Jablonowski, E J Nunez, M F Wheeler, R Banchs, H Klie, A Rodriguez and S G Thomas, Analysis of real-time reservoir monitoring: reservoirs, strategies & modeling, *Sandia National Laboratories, SAND Report*, SAND2006-7503 (2006).
- [15] Key K, S Constable and **C J Weiss**, Mapping 3D salt using the 2D magnetotelluric method: Case study from Gemini Prospect, Gulf of Mexico, *Geophysics*, **71**, B17–B27, 2006.
- [16] Constable S and **C J Weiss**, Mapping thin resistors with marine EM methods: Insights from 1D modeling, *Geophysics*, **71**, G43–G51, 2006.
- [17] Key K and **C J Weiss**, Adaptive finite element modeling using unstructured grids: the 2D magnetotelluric example, *Geophysics*, **71**, G291–G299, 2006.
- [18] **Weiss C J** and S Constable, Mapping thin resistors with marine EM methods: Modeling and analysis in 3D, *Geophysics*, **71**, G321–332, 2006.
- [19] **Weiss C J** and M E Everett, Anomalous Diffusion of Electromagnetic Eddy Currents in Geologic Formations, *Journal of Geophysical Research*, **112**, 2006JB004475, 2007.
- [20] **Weiss C J**, The fallacy of the “shallow-water problem” in marine CSEM exploration, *Geophysics*, **72** A93–A97, 2007.
- [21]⁺ Shamsalsadati S and **C J Weiss**, Retrieving the impulse response of the Earth due to random electromagnetic forcing, *Physical Review E*, **81**, doi:10.1101/PhysRevE.81.036603,2010.
- [22] **Weiss C J**, Triangulated finite difference methods for global-scale electromagnetic induction studies of whole mantle electrical heterogeneity, *G-Cubed*, Q11010, doi:10.1029/2010GC003283, 2010.
- [23] Slob E and **C J Weiss**, Lagrangian and energy forms for retrieving the impulse response of the Earth due to random electromagnetic forcing, *Phys Rev E*, **84**, doi:10.1103/PhysRevE.84.027601, 2011.
- [24]⁺ Shamsalsadati S and **C J Weiss**, Empirical Green’s function estimation for lossy systems: Analysis of the volume of relevance for the origin of ambient fluctuations, *Geophysical J. Int.*, **190**, 1526–1532 doi:10.1111/j.1365-246X.2012.05567.x (2012).
- [25]⁺ Ge G, M Everett and **C J Weiss**, Fractional diffusion analysis of the electromagnetic field generated by a transient line source in fractured media Part I: 2D Approach, *Geophysics*, **77**, WB213 doi:10.1190/geo2012-0072.1 (2012).
- [26] **Weiss C J**, Project APhiD: A Lorenz-gauged $\mathbf{A}\text{-}\Phi$ Decomposition for parallelized computation of ultra-broadband electromagnetic induction in a fully heterogeneous Earth, *Computers & Geosciences*, **58**, 40–52 doi:10.1016/j.cageo.2013.05.002 (2013).
- [27] **Weiss C J** and S D King, Resolvability of geodynamic structures in the lower mantle by naturally induced electromagnetic fields, *G-Cubed* (submitted May 2012, in revision).
- [28]⁺ Shamsalsadati S and **C J Weiss**, Time-series analysis of diffusion interferometry data and its application to Bayesian inversion of synthetic borehole pressure data, *Geophysics*, **79**, Q1–10 doi:10.1190/GEO2013-0113.1 (2014).

- [29] Kelbert A, A Kuvshinov, J Velinsky, T Koyama, J Ribaud, J Sun, Z Martinec and **C J Weiss**, Global 3-D electromagnetic forward modeling: A benchmark study, *Geophysical Journal International*, doi:10.1093/gji/ggu028, (2014)
- [30] **Weiss C J**, An overset grid method for modeling global-scale geomagnetic induction, *Geophysical Journal International*, doi:10.1093/gji/ggu/108 (2014).
- [31]⁺ Ge G, M E Everett, and **C J Weiss**, Fractional diffusion analysis of the electromagnetic field in fractured media – Part 2: 3D approach, *Geophysics*, E175–185, doi:10.1190/GEO2014-0333.1 (2015).
- [32] **Weiss C J**, D F Aldridge, H A Knox, K A Schramm and L C Bartel, Record and Preliminary Analysis of Geophysical Field Test: API Well #42-109-32670, Bone Spring Formation, Culberson County, Texas, *Sandia National Laboratories, SAND Report*, SAND2015–8392 (2015).
- [33]⁺ Samluk J P, C A Geiger and **C J Weiss**, Full-physics 3-D heterogeneous simulations of electromagnetic induction on level and deformed sea ice, *Annals of Glaciology*, **56**, 405-414 (2016).
- [34] **Weiss C J**, D F Aldridge, H A Knox, K A Schramm and L C Bartel, The DC response of electrically conducting fractures excited by a grounded current source, *Geophysics*, **81**, E201-210 (2016).
- [35]⁺ Downs C M, **C J Weiss**, and J A Bach, Electromagnetic propagation and prediction, *Sandia National Laboratories, SAND Report*, SAND2016-9523 (2016).
- [36]⁺ Beskardes G D, **Weiss C J** and M E Everett, Estimating the power-law distribution of Earth electrical conductivity from low-frequency, controlled-source electromagnetic response, *Geophysical Journal International*, **208**, 639–651 (2017).
- [37] Swidinsky A and **C J Weiss**, On coincident loop transient electromagnetic induction logging, *Geophysics*, **82**, E211 (2017).
- [38] **Weiss C J**, Finite element analysis for model parameters distributed on a hierarchy of geometric simplices, *Geophysics*, **82**, E155 (2017).
- [39] Weiss C J and B van Bloemen Waanders, On the convergence of Neumann series for electrostatic fracture response, *Geophysics* (to be submitted 2018).
- [40] Beskardes G D, van Bloemen Waanders, B and **C J Weiss**, On the electrostatic response of self-organized fracture systems in the near surface: the generalized 3D forward problem, *Geophysical Journal International* (to be submitted Spring 2018).

Book Chapters:

- [1] **Weiss C J**, The two- and three-dimensional forward problems (**INVITED**), in *The Magnetotelluric Method: Theory and Practice*, ed. A. Chave and A. Jones, Cambridge University Press, 2012.

Peer-Reviewed Extended Abstracts:

+ denotes student coauthorship

- [1] Schultz A, I Fujii, **C Weiss**, and M Everett, Three-dimensional electrical conductivity structure of the upper mantle through the transition zone: Resolution improvement and the role of permanent ocean bottom observatories, (invited) *Presented to the Ocean Hemisphere Project Symposium*, Chiba Prefecture, Japan, November 1997.
- [2] **Weiss C J** and G A Newman, Electromagnetic induction in a fully 3-D anisotropic Earth, *70th Annual Meeting of the SEG*, Calgary CA, 2000.
- [3] **Weiss C J**, A matrix-free approach to solving the fully 3D electromagnetic induction problem, 3-D anisotropic Earth, *71st Annual Meeting of the SEG*, San Antonio TX, 2001.
- [4] M E Everett and **C J Weiss**, Geologic noise in near-surface electromagnetic induction data, *71st Annual Meeting of the SEG*, San Antonio TX, 2001.
- [5] **Weiss C J** & G A Newman, A strategy for rapid solutions in modeling EM induction in anisotropic media, *72nd Annual Meeting of the SEG*, Salt Lake City UT, 2002.
- [6] Key K, S Constable and **C J Weiss**, Mapping 3D salt with 2D marine MT - Case study from Gemini Prospect, Gulf of Mexico, Third International Symposium on Three-Dimensional Electromagnetics, Adelaide, Australia, February, 2003.
- [7] **Weiss C J** and M E Everett, Anomalous diffusion of electromagnetic eddy currents in geologic materials, *Proceedings of the 1st IFAC Workshop on Fractional Differentiation and its Applications*, Bordeaux, France, July 2004.
- [8] Key K, S Constable and **C J Weiss**, Mapping 3D salt using 2D marine MT: Case study from Gemini Prospect, Gulf of Mexico *74th Annual Meeting of the SEG*, Denver CO, October 2004.
- [9]⁺ Ge J, M E Everett and **C J Weiss**, Fractional diffusion analysis of the electromagnetic fields generated by a transient straight current source over a porous media, *SAGEEP Annual Meeting*, Charleston SC, April 2011.
- [10]⁺ Shamsalsadati S and **C J Weiss**, Essential noise sources for Green's function recovery in passively-monitored diffusion systems, *SEG Expanded Abstracts*, doi: 10.1190/1.3627513, 1618-1622, 2011.
- [11]⁺ Shamsalsadati S and **C J Weiss**, Time-series analysis of interferometry in diffusive systems, *SEG Expanded Abstracts*, doi: 10.1190/segam2012-1276.1, 1-6, 2012.
- [12]⁺ Ge J, M E Everett and **C J Weiss**, 3D modeling of fractional diffusion to describe electromagnetic induction in fractured geological media *3DEM-5 Expanded Abstracts*, Sapporo, Japan, 2013.
- [13]⁺ Ge J, M E Everett and **C J Weiss**, 3D modeling of fractional diffusion to describe electromagnetic induction in fractured geological media *SEG Expanded Abstracts*, 2013.
- [14] **Weiss C J**, D F Aldridge, H A Knox, K A Schramm and L C Bartel, The DC response of electrically conducting fractures excited by a grounded current source, *SEG Expanded Abstracts*, 2015. (voted "top 30" paper out of 1500 presented)
- [15] Aldridge D F, **C J Weiss**, H A Knox, K A Schramm and L C Bartel, Is a steel-cased borehole an electrical transmission line? *SEG Expanded Abstracts*, 2015.
- [16] **C J Weiss**, H A Knox and D F Aldridge, Experiment design study in 3D DC resistivity: Adjoint sensitivities in a horizontal steel-cased borehole, *SEG Expanded Abstracts*, 2016.
- [17] **Weiss C J**, Hierarchical material properties in finite element modeling: An example in 3D DC resistivity modeling of infrastructure, 3DEM-6, 6th International Symposium on Three-Dimensional Electromagnetics, Berkeley CA (4pp extended abstract and poster), 2017.
- [18] **Weiss C J** and G Wilson, A new hierarchical finite element method for compact representation of oilfield infrastructure, *SEG Expanded Abstracts*, 2017.

- [19] Wilt M, E Um, C J Weiss D Vasco, P Petrov, G A Newman and Y Wu, Wellbore integrity assessment with casing-based advanced sensing, *Stanford Geothermal Workshop, Sep 12–14* (2018).
- [20] Weiss C J and B van Bloemen Waanders, On the convergence of Neumann series for electrostatic fracture response, *SEG Expanded Abstracts* (in prep 2018).
- [21] Beskardes, G D, van Bloemen Waanders, B and **C J Weiss**, On the electrostatic response of self-organized fracture systems in the near surface: the generalized 3D forward problem, *SEG Expanded Abstracts* (in prep 2018).
- [22] **Weiss, C J** G D Beskardes and B van Bloemen Waanders, Toward a fractional calculus representation of correlated electrical structure in the subsurface: results from brute force modeling, *SEG Expanded Abstracts* (in prep 2018).

Short Abstracts and Conference Presentations:

+ denotes student coauthorship

- [1] **Weiss C J** and M E Everett, compatibility of global electromagnetic data and seismic tomography models, *A.G.U. Fall meeting*, San Francisco CA, 1995.
- [2] Everett M E, **C J Weiss**, and A Schultz, Electromagnetic induction in a heterogeneous sphere, *Presented at International Symposium on Three-dimensional Electromagnetics*, Oct. 4–6, 1995, Schlumberger–Doll Research, Ridgefield CT.
- [3] **Weiss C J** and M E Everett, A Three-dimensional B-spline model of upper mantle electrical conductivity via nonlinear c-response inversion, *A.G.U. Fall meeting*, San Francisco CA, 1996.
- [4] **Weiss C J** and M E Everett, Alternative parameterization of Earth models: 3-D spherical splines *Presented at 13th Workshop on Electromagnetic Induction in the Earth*, Onuma, Japan, July 12-18, 1996.
- [5] **Weiss C J** and M E Everett, Generating the observed amount of lateral variability in Earth’s long-period electromagnetic response by a mid-mantle electrical conductor, *A.G.U. Fall meeting*, San Francisco CA, 1997.
- [6] **Weiss C J** and M E Everett, A local relaxation method for determining upper mantle electrical conductivity, *A.G.U. Fall meeting*, San Francisco CA, 1998.
- [7] Schultz A, D Avdeev, M Everett, A Flosadottir, I Fujii, H Igel, M Jegen, T Koyama, A Kuvshinov, Z Martinec, O Pankratov, P Tarits, H Utada, M Uyeshima, and **C Weiss**. COSY-B intercomparison experiment: Accuracy in 3D forward solvers, *14th Workshop on Electromagnetic Induction in the Earth*, Sinia, Romania, August 1998.
- [8] **Weiss C J** and M E Everett, Progress in finite element modeling of geomagnetic induction, *22nd International Conference on Mathematical Geophysics*, Cambridge, UK, July 12–17, 1998.
- [9] **Weiss C J**, Topographic effects on controlled source electromagnetic induction in an anisotropic halfspace, *A.G.U. Fall meeting*, San Francisco CA, 1999.
- [10]⁺ **Weiss C J**, P M Gregg and G A Newman, Electromagnetic induction in a fully 3D anisotropic Earth, *A.G.U. Fall meeting*, San Francisco CA, 2000.
- [11] **Weiss C J** and M E Everett, Geologic noise in near-surface time-domain electromagnetic induction data, *A.G.U. Fall meeting*, San Francisco CA, 2001.
- [12]⁺ **Weiss C J**, K Key and S Constable, Salt, sediments and seawater: Marine magnetotellurics in the Gulf of Mexico, *A.G.U. Fall meeting*, San Francisco CA, 2002.
- [13]⁺ Key K, S Constable and **C J Weiss**, New results using marine MT over a 3D structure, *Presented at 16th Workshop on Electromagnetic Induction in the Earth*, Santa Fe NM, 2002.
- [14] **Weiss C J** and G A Newman, Rapid solutions to the electromagnetic induction problem in anisotropic media, *Presented at 16th Workshop on Electromagnetic Induction in the Earth*, Santa Fe NM, 2002.

- [15]⁺ Natek N H, **C J Weiss** and H Tobin, A perturbation expansion approach to solving the electromagnetic induction problem in three dimensions, *A.G.U. Fall meeting*, San Francisco CA, 2003.
- [16] **Weiss C J** and M Everett, Anomalous diffusion of electromagnetic fields in the near surface, *A.G.U. Fall meeting*, San Francisco CA, 2003.
- [17]⁺ Constable S, K Key, J Behrens and **C Weiss**, Hydrocarbon exploration using marine controlled-source EM, *A.G.U. Fall meeting*, San Francisco CA, 2004.
- [18]⁺ Key K, S Constable, J Behrens, G Heinson and **C Weiss**, A look at the data from “Constraining the magmatic budget of the EPR at 9 N using broadband marine MT”, *A.G.U. Fall meeting*, San Francisco CA, 2004.
- [19]⁺ Behrens J, S Constable, G Heinson, M Everett **C Weiss** and K Key, Estimating upper mantle hydration from *in situ* electrical conductivity, *A.G.U. Fall meeting*, San Francisco CA, 2004.
- [20] **Weiss C J**, Y Li and M Nabighian, Mapping hydrogeophysical structures with time-domain electromagnetic methods: Resolving small-scale details with large loops and three-component measurements. *A.G.U. Fall meeting*, San Francisco CA, 2004.
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