



Florian M. Wagner

Curriculum vitae

Education

- 1997–2006 **Abitur**, *Friedrich-Wilhelm-Gymnasium*, Cologne.
General qualification for university entrance
- 2006–2009 **Bachelor of Science**, *RWTH Aachen University*.
B.Sc. in Georesources Management
- 2009–2011 **Master of Science**, *IDEA League: TU Delft, ETH Zurich, RWTH Aachen*.
Joint M.Sc. in Applied Geophysics
- since Nov. 2011 **PhD Student**, *GFZ German Research Centre for Geosciences / ETH Zurich*.

Bachelor Thesis

- Title *Evaluation of groundwater hazards for a selection of underground coal gasification (UCG) sites*
- Supervision RWTH Aachen University
- Grade 1.0 (ECTS-Grade: A)

Master Thesis

- Title *Geoelectrical detection of groundwater salinization in analog transport models*
- Supervision ETH Zurich / GFZ German Research Centre for Geosciences
- Grade 1.0 (ECTS-Grade: A)

PhD Thesis

- Title *Advanced inversion of electrical resistivity tomography for a quantitative assessment of CO₂ stored in deep saline aquifers.*
- Supervision ETH Zurich / GFZ German Research Centre for Geosciences
- Expected Date of Defense December 2015

Practical Experience

- March 2009 **Internship**, *Trasswerke Meurin*, Andernach, Germany.
Internship at Trasswerke Meurin Produktions- und Handelsgesellschaft mbH (www.meurin.com). Gained experience in the excavation of volcanic rocks for the production of quality construction materials including sieve analyses and strength tests.
- June 2010 **Field Campaign**, *ETH Zurich*, Kloten and Laegeren, Switzerland.
Comprehensive geophysical field work incorporating data acquisition, processing and reporting. Applied measuring techniques included: Electrical Resistivity Tomography (ERT), Seismic Refraction Tomography (SRT), Ground Penetrating Radar (GPR), Electromagnetics (EM31 and EM38), Transient Electromagnetics (TEM) and Magnetics.
- July 2010 **Internship**, *DMT GmbH & Co. KG*, Essen, Germany.
Large-scale 3D seismic survey by DMT GmbH & Co. KG (www.dmt.de/en/home.html) in Jointville, France.

Gained hands-on experiences in:

- Large-scale data acquisition
- Reflection & Refraction Seismics
- Vertical Seismic Profiling (VSP)
- Well Logging
- Quality Control

- September 2013 **Research visit**, *University of Alberta*, Edmonton, Canada.
I worked on acoustic and electrical analysis of reservoir sandstones in the Geomechanical Reservoir Experimental Facility (www.geo-ref.ca) of the University of Alberta in Edmonton, Canada, under supervision of Dr. Chalaturnyk and his team.

Teaching experience

- Nov. 2012 Introduction to Scientific Computing and Data Visualization using Python (Seminar talk at the German Research Centre for Geosciences)
- Summer 2013 Co-Supervision of the M.Sc. course on Geophysical Field Work and Data Processing at ETH Zurich
- Summer 2014 Co-Supervision of the M.Sc. course on Geophysical Field Work and Data Processing at ETH Zurich

Scholarships / Awards

- 2009–2011 Private scholarship from RWE Dea AG
- 2009–2011 Co-financing from the education fund of North Rhine-Westphalia
- Sep. 2012 Best oral presentation award at the 2nd Science Forum of the Helmholtz-Alberta-Initiative, Potsdam, Germany.
- Sep. 2013 Best oral presentation award at the 3rd Science Forum of the Helmholtz-Alberta-Initiative, Edmonton, Canada.
- Sep. 2014 Best oral presentation award at the 4th Science Forum of the Helmholtz-Alberta-Initiative, Edmonton, Canada.

Scientific interests

- Geophysical monitoring of subsurface fluid migration
- Tomographic experimental design
- Numerical modeling and inversion
- Data analysis and parallel computing

Languages

German	Native
English	Fluent
French	Basic knowledge

Computer skills

Programming	Linux, Scientific Python, MATLAB	Inversion	GIMLi, BERT (www.resistivity.net)
Numerical Modeling	Experiences in TOUGH2, MODFLOW, SHEMAT	Office / Writing	LaTeX, Vim, MS Office
Seismic Processing	ProMAX	Website development	HTML, CSS, Photoshop, Illustrator

Journal articles

2015

F. M. Wagner, T. Günther, C. Schmidt-Hattenberger, H. Maurer (2015): Constructive optimization of electrode locations for target-focused resistivity monitoring. *GEOPHYSICS*, 80, E29-E40, <http://dx.doi.org/10.1190/geo2014-0214.1>.

2014

C. Schmidt-Hattenberger, P. Bergmann, T. Labitzke, **F. M. Wagner** (2014): CO₂ Migration Monitoring by Means of Electrical Resistivity Tomography (ERT) - Review on Five Years of Operation by Means of Electrical Resistivity Tomography at the Ketzin Pilot Site. *Energy Procedia*, 63, 4366-4373, <http://dx.doi.org/10.1016/j.egypro.2014.11.471>.

2013

C. Schmidt-Hattenberger, P. Bergmann, D. Bösing, T. Labitzke, M. Möller, S. Schröder, **F. M. Wagner**, H. Schütt (2013): Electrical Resistivity Tomography (ERT) for Monitoring of CO₂ Migration - from Tool Development to Reservoir Surveillance at the Ketzin Pilot Site. *Energy Procedia*, 37, 4268-4275, <http://dx.doi.org/10.1016/j.egypro.2013.06.329>.

F. M. Wagner, M. Möller, C. Schmidt-Hattenberger, T. Kempka, H. Maurer (2013): Monitoring freshwater salinization in analog transport models by time-lapse electrical resistivity tomography. *Journal of Applied Geophysics*, 89, 84-95, <http://dx.doi.org/10.1016/j.jappgeo.2012.11.013>.

Conference contributions

2014

F. M. Wagner, P. Bergmann, T. Labitzke, C. Schmidt-Hattenberger, C. Rücker, H. Maurer (2014): Accounting for complex borehole completion in crosshole resistivity monitoring. *4th Helmholtz-Alberta*

Initiative (HAI) Science Forum, September 29, 2014, Edmonton, Canada.

F. M. Wagner, P. Bergmann, T. Labitzke, C. Schmidt-Hattenberger, T. Günther, H. Maurer (2014): High-Resolution Monitoring of CO₂ Injection with Permanent Electrodes: A 5-Year Retrospect from the Ketzin Site and Design Recommendations for Future Projects. *AGU Fall Meeting, 15-19 December, 2014, San Francisco, USA.*

F. M. Wagner, P. Bergmann, T. Labitzke, N. Deisman, C. Schmidt-Hattenberger, H. Maurer, R. Chalaturnyk (2014): Paving the way to estimate CO₂-saturation from geoelectrical data. *4th Helmholtz-Alberta Initiative (HAI) Science Forum, September 29, 2014, Edmonton, Canada (acknowledged with the Best Oral Presentation Award).*

2013

C. Schmidt-Hattenberger, P. Bergmann, D. Bösing, T. Labitzke, M. Möller, S. Schröder, **F. M. Wagner**, H. Schütt (2013): Permanent Downhole Geoelectrical Monitoring at the Ketzin CO₂ Pilot Site. *Second EAGE Workshop on Permanent Reservoir Monitoring 2013 - Current and Future Trends (Stavanger, Norway 2013)*, <http://dx.doi.org/10.3997/2214-4609.20131314>.

C. Schmidt-Hattenberger, P. Bergmann, T. Labitzke, **F. M. Wagner** (2013): Electrical Resistivity Tomography (ERT) as a permanent monitoring tool to image the CO₂ migration at the Ketzin pilot site - Experiences from more than five years of operation. *2nd Internat. Workshop on Geoelectrical Monitoring, GELMON 2013, Vienna, 04.-06.12.2013, Berichte Geol. B.-A., 104, ISSN 1017-8880.*

F. M. Wagner, T. Günther, C. Schmidt-Hattenberger, H. Maurer (2013): On the Design of Cross-hole Resistivity Arrays for High-resolution and Cost-effective Storage Reservoir Monitoring. *Near Surface Geoscience 2013 - the 19th European Meeting of Environmental and Engineering Geophysics of the Near Surface Geoscience (Bochum 2013)*, <http://dx.doi.org/10.3997/2214-4609.20131430>.

F. M. Wagner, T. Günther, C. Schmidt-Hattenberger, H. Maurer (2013): Optimized crosshole resistivity monitoring strategies for geological carbon dioxide storage reservoirs. *3rd Helmholtz-Alberta Initiative (HAI) Science Forum, September 2013, Edmonton, Canada (acknowledged with the Best Oral Presentation Award).*

F. M. Wagner, T. Günther, C. Schmidt-Hattenberger, H. Maurer (2013): Estimating optimum electrode locations for high-resolution cross-hole resistivity monitoring. *2nd Internat. Workshop on Geoelectrical Monitoring, GELMON 2013, Vienna, 04.-06.12.2013, Berichte Geol. B.-A., 104, ISSN 1017-8880.*

F. M. Wagner, C. Schmidt-Hattenberger, P. Bergmann, T. Labitzke, R. Chalaturnyk, B. Giroux (2013): Towards quantitative monitoring of CO₂ with time-lapse electrical resistivity tomography (ERT): Experiences from the Ketzin pilot site, Germany. *3rd Annual Conference of Carbon Management Canada, Calgary, Canada.*

2012

T. Kempka, R. Endler, D. Eydam, R. Herd, E. Huenges, C. Jahnke, E. Jolie, S. Janetz, Y. Krause, M. Kühn, F. Magri, I. Moeck, M. Möller, G. Muñoz, B. Nakaten, O. Ritter, W. Schafrik, C. Schmidt-Hattenberger, E. Schöne, E. Tillner, H. Voigt, **F. M. Wagner**, G. Zimmermann (2012): CO₂-storage in eastern Brandenburg: Implications for geothermal heat provision and conception of a salinisation early warning system - Review of current progress of the joint-project brine. *Schriftenreihe der Deutschen Gesellschaft für Geowissenschaften 78.*

M. Möller, C. Schmidt-Hattenberger, **F. M. Wagner**, S. Schröder (2012): Hochauflösende Geoelek-

trik als Teil eines Frühwarnsystems zur Überwachung einer möglichen Grundwasserversalzung bei der CO₂-Speicherung. *72. Jahrestagung der Deutschen Geophysikalischen Gesellschaft (DGG) (Hamburg 2012)*.

F. M. Wagner, B. Hosseini, T. Kempka, C. Schmidt-Hattenberger, R. Chalaturnyk (2012): Optimized resistivity monitoring strategies for geological carbon dioxide storage based on reservoir simulations. *2nd Science Forum of the Helmholtz-Alberta-Initiative, Potsdam Sep. 2012 (acknowledged with the Best Oral Presentation Award)*.

F. M. Wagner, M. Möller, C. Schmidt-Hattenberger, T. Kempka, H. Maurer (2012): Monitoring brine migration in analog transport models using surface-to-hole ERT. *Geophysical Research Abstracts Vol. 14, EGU2012-2101, 2012*.

F. M. Wagner, C. Schmidt-Hattenberger, P. Bergmann, T. Labitzke, M. Möller, S. Schröder (2012): Quantitative CO₂ monitoring via time-lapse electrical resistivity tomography (ERT): From tool development to advanced inversion strategies. *3rd Annual Meeting, Helmholtz Alberta Initiative (Edmonton, Alberta, Canada 2012)*.

2011

M. Möller, C. Schmidt-Hattenberger, **F. M. Wagner**, S. Schröder (2011): Development of an integrated monitoring concept to detect possible brine migration. *1st International Workshop on Geoelectrical Monitoring - GELMON (Vienna 2011)*.

F. M. Wagner, M. Möller, C. Schmidt-Hattenberger, T. Kempka, H. Maurer (2011): Detection of groundwater salinisation by geoelectric measurements. *EGU General Assembly 2011, Vienna*.