

CO2-GS PUBLICATION STATUS March 2014

Peer Reviewed Publications

Auken, E., Doetsch, J., Fiandaca, G., Christiansen, A.V., Gazoty, A., Cahill, A.G., Jakobsen, R., 2014, Imaging subsurface migration of dissolved CO₂ in a shallow aquifer using 3-D time-lapse electrical resistivity tomography, *Journal of Applied Geophysics*, 101, 31-41, doi:10.1016/j.jappgeo.2013.11.011.

Behroozmand, A. A., Auken, E., Fiandaca, G., and Christiansen, A. V., 2012, Improvement in MRS parameter estimation by joint and laterally constrained inversion of MRS and TEM data: *Geophysics*, 74, WB191-WB200.

Cahill, A. G. and Jakobsen, R., 2013, Hydro-geochemical impact of CO₂ leakage from geological storage on shallow potable aquifers: A field scale pilot experiment. *Int. J. Greenhouse Gas Control* **19**: 678-688.

Cahill, A. G., Jakobsen, R. and Marker, P. A., 2014, Hydrogeochemical and Mineralogical Effects of Sustained CO₂ Contamination in a Shallow Sandy Aquifer: A field scale controlled release experiment. *Water Resour. Res.*, **50**, doi:10.1002/2013WR014294.

Cahill, A. G., Jakobsen, R., Mathiesen, T. B. and Jensen, C. K., 2013, Risks attributable to water quality changes in shallow potable aquifers from geological carbon sequestration leakage into sediments of variable carbonate content. *Int. J. Greenhouse Gas Control* **19**: 117-125.

Fiandaca, G., Auken, E., Gazoty, A., and Christiansen, A. V., 2012, Time-domain induced polarization: Full-decay forward modeling and 1D laterally constrained inversion of Cole-Cole parameters: *Geophysics*, 77, E213-E225.

Fiandaca, G., Ramm, J., Binley, A., Gazoty, A., Christiansen, A. V., and Auken, E., 2013, Resolving spectral information from time domain induced polarization data through 2-D inversion: *Geophysical Journal International*, 192, 631-646.

Lassen, R.N., Plampin, M., Sakaki, T., Illangasekare, T.H., Gudbjerg, J., Sonnenborg, T.O., Jensen, K.H., Effects of Geologic Heterogeneity on Migration of gaseous CO₂ using Laboratory and Modelling Investigations. Submitted.

Mbia E. N., Fabricius I.L., Collins, O., 2013. Equivalent pore radius and velocity of elastic waves in shale. Skjold Flank-1 Well, Danish North Sea. *Journal of Petroleum Science and Engineering*, 109 (2013) 280–290.

Mbia E. N., Fabricius I.L., Krogsbøll A., Frykman P., Dalhoff, D., 2014. Permeability, compressibility and porosity of Jurassic shale from the Norwegian-Danish Basin. *Journal of Petroleum Geosciences*, (under 2nd revision).

Mbia E. N., Fabricius I.L., Frykman P., Bernstone C., Pickup G., Nielsen, C. M., 2014. Caprock Compressibility and Permeability and the Consequences for Pressure Development in CO₂ Storage sites. *International Journal of Greenhouse Gas Control* 22, 139–153.

Mbia, E. N., Frykman P., Nielsen, C. M., Fabricius I.L., Pickup G., Sørensen T., 2014. Modelling of the pressure propagation due to CO₂ injection and the effect of fault permeability in a case study

of the Vedsted structure. (Accepted for publication in International Journal of Greenhouse Gas Control).

Pryet, A., Ramm, J., Chilès, J.-P., Auken, E., Deffontaines, B. and Violette, S., 2011, 3D resistivity gridding of large AEM datasets: A step toward enhanced geological interpretation. *Journal of Applied Geophysics*, 75, 277 - 283.

Thaysen, E.M., Jessen, S., Ambus, P., Beier, C., Postma, D. and Jakobsen I., 2014, Mesocosm approach to quantification of carbon dioxide fluxes across the vadose zone. *Biogeosciences* 11, 1077–1084.

Thaysen, E.M., Jacques, D., Jessen, S., Laloy, E., Ambus, P., Postma, D. and Jakobsen, I. 2014, Inorganic carbon fluxes across the vadose zone in unplanted and planted soil mesocosms *Biogeosciences Discuss.*, 11, 1–49.

Conference Contributions

Auken, E. and Fiandaca, G., 2012, Transmitter waveform and receiver transfer function modelling in time domain induced polarization ASEG 2012, Brisbane, Australia.

Behroozmand, A.A, E. Auken, G. Fiandaca, A. V. Christiansen., 2011, Joint Inversion of MRS and TEM Data, Abstract, AGU.

Behroozmand, A. A., Auken, E., Fiandaca, G., and Christiansen, A. V., 2012, MRS parameter estimation - improvement by joint and laterally constrained inversion of MRS and TEM data 18th European Meeting of Environmental and Engineering Geophysics, Paris.

Behroozmand, A. A., Auken, E., Fiandaca, G., and Christiansen, A. V., 2012, Improvement in MRS parameter estimation - a closer step toward hydrogeological interpretations SEG-AGU Hydrogeophysics workshop, Boise, Idaho, US.

Cahill, A. and R. Jakobsen., 2012, Hydro-geochemical impact of CO₂ leakage from geological storage on shallow potable aquifers: A field scale pilot experiment. EGU 2012 Oral Presentation.

Cahill, A., R. Jakobsen and C. H. Larsen. 2012, Hydro-geochemical impact of CO₂ leakage from CCS on shallow potable aquifers: batch, tank and field scale experiments. Goldschmidt Geochemistry Conference. Oral Presentation.

Cahill, A., R. Jakobsen and P. Marker., 2012, Hydro-geochemical impact of CO₂ leakage from CCS on shallow potable aquifers: Danish Field Release Experiments. IEAGHG Environmental Impacts of CO₂ Storage Workshop Series (by Invitation) Oral Presentation

Christensen F. D, 2012, Carbon Capture and Storage . Poster at the FEFLOW International Conference, Berlin 2012

Doetsch, J., Fiandaca, G., Auken, E., Christiansen, A.V., Cahill, A.G., Jakobsen R., 2014, Monitoring of a CO₂ injection by time domain SIP, 3rd Int. Workshop on Induced Polarization, Oléron Island, France.

Doetsch, J., Auken, E., Christiansen, A.V., Fiandaca, G., Ramm, J., 2013, 3-D time-lapse electrical resistivity monitoring of injected CO₂ in a shallow aquifer, EAGE Near Surface Geoscience 2013, Bochum, Germany, TuS2a11.

Doetsch, J., Fiandaca, G., Auken, E., Christiansen, A.V., Cahill, A.G., Jakobsen, R., 2014, Monitoring of CO₂-induced geochemical changes in a shallow aquifer by time domain spectral induced polarization, European Geosciences Union, Geophysical Research Abstracts 16, EGU2014-10294.

Doetsch, J., Christiansen, A.V., Auken, E., Fiandaca, G., Cahill, A.G., 2013, 3-D time-lapse electrical resistivity monitoring of injected CO₂ in a shallow aquifer, Abstract H51H-1292 presented at 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.

Doetsch, J., Günther, T., Auken, E., Christiansen, A.V., Fiandaca, G., 2013, Constraining time-lapse ERT inversions by hydrological point measurements, 2nd International Workshop on Geoelectrical Monitoring GELMON 2013, Vienna.

Fiandaca, G., Ramm, J., Auken, E., Binley, A., and Christiansen, A. V., 2012, Layered and Laterally Constrained 2D Inversion of Time Domain Induced Polarization Data EAGE - Near Surface Geoscience 2012, Paris, France.

Fiandaca, G., Ramm, J., Binley, A., Gazoty, A., Christiansen, A. V., and Auken, E., 2012, Time domain induced polarization: 2D inversion for spectral information OGS - GNGTS2012, Trieste, Italy.

Fiandaca, G., Auken, E., Christiansen, A. V., and Gazoty, A., 2012, Full Waveform Modelling of Time Domain Induced Polarization OGS - GNGTS2012, Trieste, Italy.

Fiandaca, G., Doetsch, J., Auken, E., Christiansen, A.V., 2013, DC/IP Monitoring of Injected CO₂ in a Shallow Aquifer, 2nd International Workshop on Geoelectrical Monitoring GELMON 2013, Vienna.

Jessen, S., Postma, D., Jakobsen, R., Looms M. C. and Larsen, F., 2014, Inhibition of carbon transfer across the vadose zone by 20th century acid rain. Accepted for poster at EGU General Assembly 2014.

Lassen, Rune N., Toshihiro Sakaki, Michael R. Plampin, Rajesh Pawar, Karsten H. Jensen, Torben Sonnenborg and Tissa H. Illangasekare . 2011, Study of effects of formation heterogeneity of carbon dioxide gas migration using a two-dimensional intermediate scale tank, Poster, AGU

Lassen, Rune N., Majken Looms, Karsten H. Jensen, Torben Sonnenborg and Aaron Cahill., 2012 Monitoring CO₂ gas-phase injection in a shallow sand aquifer using cross borehole GPR. Poster EGU

Lassen, R., Looms, M.C., Jensen, K.H., Sonnenborg, T. (2012). Monitoring CO₂ gas-phase injection in a shallow sand aquifer using cross borehole GPR. AGU Fall meeting (3-7 December 2012, San Francisco).

Lassen, R.N., Jensen, K.H, Looms, M.C., Sonnenborg, T., Gudbjerg, J. (2013). Monitoring CO₂ gas-phase injection in a shallow sand aquifer using cross borehole GPR and modeled with T2VOC multi-phase code, AGU Fall meeting (9-13 December 2013, San Francisco).

Mbia, E. N., Fabricius, I.L., Frykman, F., Krogsbøll, A., Dalhoff, F., 2014. Quantifying Porosity, Compressibility and Permeability in Shale. Extended abstract and presentation at the Fourth EAGE Shale Workshop 6–9 April 2014, Porto, Portugal.

Mbia, E. N., Fabricius, I.L., Frykman, F., Nielsen, C.M, Bernstone, C., Pickup, G., 2013. Caprock compressibility and the consequences for pressure development in CO₂ storage sites. Extended abstract and presentation at the 7th Trondheim CCS Conference (TCCS-7), 04–06 of June 2013 in Trondheim, Norway.

Mbia, E.N., Fabricius, I.L. & Krogsbøll, A. Different Methods of Predicting Permeability in Shale. Extended abstract and presentation at the third EAGE Shale Workshop Shale Physics and Shale Chemistry, 4–7 June 2012, Copenhagen, Denmark.

Mbia, E. N. & Fabricius, I. L., 2012. Pore Radius and Permeability Prediction from Sonic Velocity. Extended abstract and presentation at the 3rd EAGE Shale Workshop, 23–25 January 2012 in Barcelona, Spain.

Mbia, E.N & Fabricius, I.L., 2011. Petrophysics of Shale Intervals in the Skjold Field, Danish North Sea. Extended abstract and presentation at the 73rd EAGE Conference & Exhibition incorporating SPE EUROPEC, 23–26 May 2011 in Vienna Austria.

Pawar, Rajesh, Zora Dash, Toshihiro Sakaki, Michael R. Plampin, Rune Noerbaek Lassen, Tissa H Illangasekare, George Zylvoloski., 2011, Numerical modeling of experimental observations on gas formation and multi-phase flow of carbon dioxide in subsurface formations. Poster, AGU

Plampin, Michael, Toshihiro Sakaki, Rune Lassen, Rajesh Pawar, Mitsuru Komatsu, Karsten Jensen, and Tissa Illangasekare. A fundamental study of gas formation and migration during leakage of stored carbon dioxide in subsurface formations. Poster, AGU 2011

Ramm, J., G. Fiandaca, A. Binley, E. Auken, A. Gazoty, A.V. Christiansen, 2011, 2D Time Domain Induced Polarization Inversion, Abstract, Near Surface Leicester, UK.

Thaysen, E., Ambus, P., Jakobsen, I., 2011, Climate change mitigation by plant mediated transfer and storage of carbon in aquifers, CESAR CONFERENCE, Aarhus, DK. Poster.

Thaysen, E., Jessen, S., Beier, C., Ambus, P., Postma, D. Jakobsen, I., 2013, Plant-mediated transfer of CO₂ to aquifers as influenced by crushed concrete waste, EGU, Vienna, Austria. Oral Presentation.

Thaysen, E., Jacques, D., Laloy, E., 2013, CO₂ fluxes to aquifers beneath cropland: merging measurements and modeling, Hydrus conference, Praha, Czech Republic. Oral Presentation and conference paper.

Non-peer reviewed publications

Jessen, S., Jakobsen, R. and Postma, D. *Syreregn spænder ben for CO₂-fjernelse*. Teknik & Miljø, Oktober 2013, 34-35.

Planned Publications (please indicate the planned date of submission and the intended Journal)

Monitoring of shallow CO₂ gas injection by Crossborehole Georadar, to be submitted April 2014. First author Rune Nørbaek Lassen (KU partner)

Numerical modeling of CO₂ gas migration in heterogeneous geological settings. First author Rune Nørbæk Lassen

Plant-mediated transfer of CO₂ to aquifers as influenced by crushed concrete waste and lime amendments. Eike Marie Thaysen, Søren Jessen, Diederik Jacques, Rasmus Jakobsen, Eric Laloy, Dieke Postma, Iver Jakobsen. To be submitted to Environmental Science and Technology.

Modelling inorganic carbon transfer to aquifers with infiltrating groundwater: Implications of acidic unsaturated zones. Søren Jessen, Dieke Postma, Rasmus Jakobsen, Majken Caroline Looms, Flemming Larsen, et al. Journal to be decided, submission aimed medio-late 2014.

Applicability of methods used to determine hydro-geochemical impact of CO₂ leakage from CCS on shallow potable aquifers: a comparison of batch, tank and field scale experiments. A. Cahill et al. submission aim: sometime in 2014.

A.Cahill, R. Jakobsen, P.Marker. One Dimensional Reactive Transport Modelling of a Sustained Shallow Aquifer CO₂ Release Experiment: Model Assessment and Scenario Study. Ready for submission to Journal of Environmental Earth Science

Doetsch, J., Fiandaca, G., Auken, E., Christiansen, A.V., Cahill, A.G., Jakobsen, R., Field scale time-domain spectral induced polarization monitoring of geochemical changes induced by injected CO₂ in a shallow aquifer. To be submitted to Geophysics by the end of April 2014.