DECOVALEX Coupled Processes Symposium 2019

University of Applied Sciences and Arts Northwestern Switzerland
Bahnhofstrasse 6, 5210 Brugg-Windisch

Poster Session: Monday, November 04, 2019, 16:00–17:30

Engineered Barrier Systems	
01	**Modelling Volume Change Behaviour of Compacted Bentonite Using a Hydro - Mechanical Coupled Framework** Jose A. Bosch, Alessio Ferrari, Lyesse Laloui
02	**Unconfined Compressive Strength for Unsaturated-Saturated Bentonite** Tomoyoshi Nishimura, Shuichi Yamamoto, Sin Sato, Motoki Moriiwa
03	**Thermo-Hydro-Mechanical Coupled Simulation of FEBEX *In Situ* Test** Yusuke Takayama
04	**Influence of Pore Water Vaporization on Saturation Process in the Buffer Material Coupled Thermo–Hydro–Mechanical Analysis** Shin Sato, Hirokazu Oono, Kenji Tanai, Shuichi Yamamoto, Masaaki Fukaya, Tomoyuki Shimura, Sumio Nyuunoya
05	**Numerical Analysis of Coupled Hydro-Mechanical and Thermo-Hydro-Mechanical Behavior of Buffer Materials** Changsoo Lee, Jaewon Lee, Geon Young Kim
06	Intentionally left blank
07	**Shaft Sealing Elements Made of Bitumen – Numerical Analysis of the Construction Process and Long-Term Behaviour** Philipp Herold, Christian Müller, Victoria Burlaka, Michael Jobmann
08	**Parameter Study of Bentonite Based Drift Sealing Concepts in German Repositories in Crystalline** Victoria Burlaka, Michael Jobmann, Philipp Herold
09	**The Hydraulic Performance Evolution of Compacted GMZ Bentonite Corroded By Cement Degradation in a HLW Repository Condition** Zhao Sun, Yong-gui Chen, Yu-jun Cui, Wei-min Ye, Chuang Yu
10	**Impact of Earthquakes on Geotechnical Barriers** Christian Müller, Philipp Herold
11	**Modelling of atmospheric cement carbonation in disposal containers for low- and intermediate-level nuclear waste** L. Wissmeier, N. Hubschwerlen, I. Munier, B. Cochepin, X. Bourbon, L. Trenty
12	**Coupled HM and THM Interactions in Bentonite Engineered Barrier Systems** Chia-Wei Kuo, Gour-Tsyh Yeh
13	**A Multi-Level Pore Scale Reactive Transport Model for The Investigation of Combined Leaching and Carbonation of Cement Paste** Ravi A. Patel , Sergey V. Churakov, and Nikolaos I. Prasianakis
Gas Transport	
14	**HM Coupled Modeling of Gas Migration in Buffer Materials of Deep Geologic Repository for Nuclear Waste** Shu-Hua Lai, Gour-Tsyh (George) Yeh
15	**Development of a Poro-Elastoplastic (With Damage) Mathematical Model to Simulate Two-Phase Flow in a Swelling Geomaterial** E.E. Dagher, T.S. Nguyen, J.A. Infante Sedano
16	**Applicability of an Empirical Model for Pressure-induced Permeability Change in Saturated Bentonite Using OpenGeoSys** T. Brüning, H. Shao, J. Hesser, W. Wang, O. Kolditz
17	**Nonlinear Dynamics of Gas Migration in Compacted Clay** Yifeng Wang, Boris Faybishenko, Jon Harrington
18	**Advective Gas Flow Modelling Using a Mechanical Damage Model** Jaewon Lee, Chansoo Lee, Geon Young Kim
19	**Modelling Gas Flow in Clay Materials: Analysis of Boundary Conditions, Flow Direction, Material Heterogeneity, and Anisotropy** I.P. Damians, S. Olivella, A. Gens
20	**TOUGH-RBSN Modeling of Generation of Discrete Gas Flow Pathways in Bentonite** Kunhwi Kim, Jonny Rutqvist, Jens Birkholzer

DECOVALEX Coupled Processes Symposium 2019

University of Applied Sciences and Arts Northwestern Switzerland
Bahnhofstrasse 6, 5210 Brugg-Windisch

Poster Session: Monday, November 04, 2019, 16:00–17:30

Coupled Processes in Crystalline Rock	
21	**Modelling Fluid Flow in an Excavation Damage Zone** Tobias Meier
22	**Modeling the Groundwater Recovery Experiment in Tunnel with a Discrete Fracture Network** Hironori Onoe, Yusuke Ozaki, Teruki Iwatsuki
23	**Thermo-Mechanical Coupled Modelling of a Long-Term Evolution of the Final Repository for Spent Nuclear Fuel at Forsmark, Sweden** Jeoung Seok Yoon, Arno Zang, Ove Stephansson, Carl-Henrik Pettersson, Flavio Lanaro
24	**Flow and Non-Reactive Transport Modeling of Recovery Experiments at the Mizunami Underground Research Laboratory** Teklu Hadgu, Yifeng Wang, Elena Kalinina
25	**Reactive-Transport Simulation of Groundwater Recovery Experiment in Tunnel** Yusuke Ozaki, Hironori Onoe, Teruki Iwatsuki
26	**Hydraulic and Transport Model of a Drift Excavation and Flooding Using Coupled Fracture-Continuum Approach** Milan Hokr, Aleš Balvín, Josef Zeman
27	**Thermo-Hydrodynamic Response of Sparse Fracture Systems to Heat Injection** B. Brixel, M. Klepikova, Q. Lei, C. Roques, M.R., Jalali, S. Loew
28	**The Numerical Model of the Planned URF Thermo-Mechanical Experiment: Sensitivity Analysis** Valentina Svitelman, Elena Saveleva, Matvey Gorelov, Evgeny Moiseenko, Nikolay Drobyshevsky
29	**3D Discrete Element Modelling of the Interference Tests in the Aspö HRL, Sweden** Saeha Kwon, Carl-Henrik Petterson, Joel Geier, Tobias Meier, Ki-Bok Min
30	**Simulation of Hydro-Mechanically Coupled Processes in Rough Rock Fracture Intersections Using an Immersed Boundary Method and Variational Transfer Operators** Cyrill von Planta, Daniel Vogler , Xiaoqing Chen, Maria G.C. Nestola, Martin O. Saar, Rolf Krause
Coupled Processes in Claystone	
31	**Numerical Study of Damage by Phase Field Method in Coupled THM Conditions and Application to Heating Test Simulation** Zhan Yu, Jianfu Shao, Minh-Ngoc Vu, Gilles Armand
32	**Investigating the Thermal, Hydraulic and Mechanical Response of the Cox to Thermal Load at Experimental and Repository Scale** Kate Thatcher, Alex Bond, Simon Norris
33	**Geomechanical Response of Carbonate-Rich Opalinus Clay to Carbonated Water** Taeheon Kim, Alberto Minardi, Lyesse Laloui
34	**DECOVALEX 2019 Task E: Numerical Simulation of THM Processes in the Bure Heater Experiments Using a Failure Dependent Permeability Model** Wenqing Wang, Hua Shao, Lars Bilke, Dmitri Naumov, Thomas Nagel, Olaf Kolditz
35	**Predictive HM-Modeling in the Heterogeneous Opalinus Clay of the Mont Terri Rock Laboratory and Validation With Monitoring Data from a Mine-By Test** D. Jaeggi, J. Hesser, C. Li, C. Nussbaum, P. Bossart
36	**Mechanical and Hydraulic Characterization of the Excavation Disturbed Zone (EDZ) in the Opalinus Clay of the Mont Terri Rock Laboratory** Sina Hale, Xavier Ries, David Jaeggi, Philipp Blum
37	**Mineralogical, Structural and Geometric Properties of Old EDZ Fractures in the Opalinus Clay Shale** Martin Ziegler, Molly Williams, Dominik Zangerl, Simon Loew
38	**Modeling of Thermal Induced Pressurization in COx Claystone** Hao Xu, Jonny Rutqvist, Carlos Plua, Gilles Armand, Jens T. Birkholzer

DECOVALEX Coupled Processes Symposium 2019

University of Applied Sciences and Arts Northwestern Switzerland
Bahnhofstrasse 6, 5210 Brugg-Windisch

Poster Session: Monday, November 04, 2019, 16:00–17:30

Coupled Processes in Rock Salt	
39	**Horizontal Borehole Experiments and Simulations to Understand Heat, Brine and Vapor Migration in Bedded Salt** Philip Stauffer, Kris Kuhlman, Hakim Boukalfa, Michelle Bourret, Brian Dozier, Eric Guiltinan, Terry Miller, Shawn Otto, Jonny Rutqvist, Douglas Weaver
40	**Coupled Thermo-Hydro-Mechanical Model of Ground Surface Deformation at Swiss Heat Storage Sites** Daniel T. Birdsell, Martin O. Saar
Fault Slip and Induced Seismicity	
41	**Coupled Hydro-Mechanical Modelling of Fault Slip induced by Water Injection in Low Permeability Rock** Jung-Wook Park, Taehyun Kim, Eui-Seob Park, Yves Guglielmi, Bastian Graupner, Jonny Rutqvist
42	**Modelling of Fluid-Injection-Induced Fault Reactivation in an Argillaceous Rock** Ting-Yu Fan, Chin-Yu Lin, Hsien-Chou Lin, Shu-Jun Chang
43	**Mathematical Modelling of Fault Activation from Water Injection at an Underground Research Facility** T.S. Nguyen, J. Brown, B. Graupner, Y. Guglielmi, J. Rutqvist
44	**Modelling of Fluid Injection Induced Fault Reactivation by Hydro-Mechanical Coupled 2D & 3D Distinct Element Models** Jeoung Seok Yoon, Arno Zang, Carl-Henrik Pettersson
45	**An Extension to the FE Method-Based Simulator OpenGeoSys to Represent Shear Rupture** Luca Urpi, Bastian Graupner, Wenqing Wang, Thomas Nagel, Antonio P. Rinaldi
Cross-Cutting Topics and Emerging Methods	
46	Intentionally left blank
47	**A Multiphysics Platform for Modelling Coupled Deformation, Damage, Flow and Transport in Fractured Rocks** Qinghua Lei, Nima Gholizadeh Doonechaly, Xiaoguang Wang, Chin-Fu Tsang, Simon Loew
48	**Accelerating Geochemical Equilibrium and Kinetics Calculations for Modeling Radioactive Waste Disposal** Svetlana Kyas, Martin O. Saar, Allan M. M. Leal
49	**Decoding Nanoscale Chemical Mechanical Heterogeneity of Shale** Xu Tang, Devon S. Jakob, Xiaoji G. Xu, Robert Mokaya, Nino Ripepi
50	**Hydro-Mechanical Processes in a Single Rough Fracture: Effect of Fracture Geometry** Hoda Javanmard, Daniel Vogler, Anozie Ebigbo , Martin Saar
51	**BenVaSim—Introduction to a Benchmarking of TH²M Simulators for Subsurface Applications with First Results** Michael Rutenberg, Jörg Feierabend, Karl-Heinz Lux, Jobst Maßmann, Manuel Lorenzo Sentís, Bastian J. Graupner, Jürgen Hansmann, Oliver Czaikowski, Larissa Friedenberg, Stephan Hotzel, Ingo Kock, Jonny Rutqvist, Mengsu Hu, Antonio P. Rinaldi
Radionuclide Transport and Performance Assessment	
52	**Integrating Near-Field THMC Processes into Field-Scale THC Simulations for Nuclear Waste Repository Performance Assessment** Michael Nole, Kyung Won Chang, Emily Stein, Dave Sevougian, LianGe Zheng, Jonny Rutqvist
53	**Thermal-Hydrologic Design Constraints for the Disposal of High-Heat Waste Packages in a Deep Geologic Repository** Tara LaForce, Emily Stein, David Sevougian, Glenn Hammond, Michael Nole, HeeHo Park, Kyung Won Chang
54	**Diffusion Simulation of Radionuclide Transport and Sorption Processes in the Opalinus Clay** Theresa Hennig, Thomas Kempka, Michael Kühn
55	**Use of High Performance Computing Cluster for Reactive Transport Modelling** Jan Šembera, Pavel Štrof, Josef Zeman, Naďa Rapantová
56	**On Conceptual Models of Chaotic Advection and Diffusion in Complex Fractured-Porous Media** Boris Faybishenko, Jens Birkholzer