

Symposium Agenda

Monday, November 04, 2018

Welcome and Opening Ceremony (Chair: B. Graupner, ENSI)	
8:00	Arrival and Registration
9:00	Welcome, Safety, and Logistics Symposium Co-Chair: Bastian Graupner, Swiss Federal Nuclear Safety Inspectorate (ENSI), Switzerland
9:15	Welcome Note Felix Altorfer: Director of the Waste Management Department, ENSI
9:30	Keynote - Coupled Processes in the Context of Radionuclide Waste Disposal: Importance to the Safety Case Frédéric Plas: Director of Research and Development, Andra, France
10:00	Overview of the DECOVALEX Project – The Past, Current, and Future Symposium Co-Chair: Jens Birkholzer, Lawrence Berkeley Nation Laboratory, Berkeley, USA
10:30	Break
Session 1: Engineered Barrier Systems & Engineered-Natural Material Interactions (Chair: C. Tournassat, BRGM)	
11:00	HM and THM Interactions in Bentonite Engineered Barriers Antonio Gens
11:15	Homogenisation in Bentonite: Lesson Learned From Laboratory Testing Katherine A. Daniels, Jon F. Harrington, Patrik Sellin
11:30	Hydro-Mechanical Behavior of a Bentonite Pellet/Powder Mixture. Experimental and Modelling Results Nadia Mokni, Agustín Molinero Guerra, Yu-Jun Cui, Pierre Delage
11:45	Modelling of THM Processes in Bentonite Sealing Barriers Radim Blaheta, Zdeněk Michalec, Martin Hasal, Tomáš Ligurský
12:00	Modelling of Reactive Transport in Bentonite Considering Chemo-Mechanical Coupling A. Jenni, A. Yustres, P. Wersin, V. Navarro, E. Muuri, M. Niskanen
12:15	Coupled Processes across a Claystone-Concrete Interface: Results of a Combined X-Ray CT and PET Transport Experiment U. Mäder, E. Bernard, J. Kulenkampff, A. Jenni
12:30	Lessons Learned from THMC Modeling of a Long-Term in Situ Test for an Engineered Barrier System Liang Zheng, Hao Xu, Jonny Rutqvist, Jens T. Birkholzer
12:45	Lunch
Session 2: Gas Transport & Coupled Processes in Crystalline Rock (Chair: Sam Krevor, Imperial College)	
13:45	Gas Transport in Bentonite – a Model Validation Exercise in the Context of SKB's EBS Task Force P. Marschall, C. Li, E. Romero, L. González Blanco, A. Madaschi, L. Laloui, A. Papafotiou
14:00	Modelling Advective Gas Flow in Compact Bentonite: Lessons Learnt from Different Numerical Approaches J.F. Harrington, E. Tamayo-Mas, H. Shao, E.E. Dagher, J. Lee, K. Kim, S.H. Lai, N. Chittenden, Y. Wang, I.P. Damians, S. Olivella
14:15	Development of an Upscaled HM Model for Representing Advective Gas Migration Through Saturated Bentonite Neil Chittenden, Steven Benbow, Alex Bond, Simon Norris
14:30	Simulating Hydraulic Tests in an Excavation Damage Zone Tobias Meier
14:45	Planned Coupled Thermo-Mechanical Experiments in the Nizhnekansk Underground Research Facility Evgeny Moiseenko, Nikolay Drobyshevsky, Roman Butov, Yuriy Tokarev
15:00	Methodology Development for Modelling and Simulation of the Environmental Recovery Process after the Tunnel Closure - Overview of DECOVALEX-2019 Task C: GREET Teruki Iwatsuki
15:15	Direct in-situ Probing of Fracture Deformation Coupled to Fluid Pressure at Relevant Nuclear Waste Repository Depths – The COSC-1 Deep Borehole Experiments (Sweden) Auli Niemi, Yves Guglielmi, Patrick Dobson, Paul Cook, Chris Juhlin, Chin-Fu Tsang, Benoit Dessirier, Alexandru Tatmir, Henning Lorenz, Farzad Basirat, Bjarne Almqvist, Emil Lundberg, Jan-Erik Rosberg
15:30	Break
Poster Session	
16:00 -17:30	Please Refer To the Poster Session List.
Banquet Dinner	
19:00	Banquet Dinner at Grand Casino Baden, Haselstrasse 2, 5400 Baden Invited Dinner Presentation, Chin-Fu Tsang, Uppsala University, Sweden

Symposium Agenda

Tuesday, November 5, 2019

Keynote Presentation (Chair: J. Birkholzer, LBNL)	
9:00	Keynote - Subsurface Energy Applications and the Importance of Coupled Processes in Shales Lyesse Laloui: Professor, Swiss Federal Institute of Technology, EPFL Lausanne, Switzerland
Session 3: Coupled Processes in Rock Salt and Claystone (Chair: P. Marschall, Nagra)	
9:30	Brine Availability Test in Salt (BATS): Coupled Processes Kris Kuhlman
9:45	Investigation of THMC-Coupled Processes on Sealing Systems in Rock Salt Kyra Jantschik, Oliver Czaikowski, Thorsten Meyer
10:00	Quantification of Hydrocarbon Release due to Underground Excavation in Rock Salt Hua Shao, Yifeng Wang, Thomas Nagel, Olaf Kolditz, Keita Yoshioka
10:15	The Full-Scale Emplacement (FE) Experiment Modelling Task Force A. Alcolea, A. Madaschi, J.A. Bosch, A. Ferrari, L. Laloui, I.P. Damians, S. Olivella, A. Gens, P. Marschall, B. Garitte, B. Firat-Lüthi
10:30	A Reliable Numerical Analysis for Large-Scale Modelling of a High-Level Radioactive Waste Repository in the Callovo-Oxfordian Claystone C. Plua, G. Armand, M. N. Vu, J. Rutqvist, J. Birkholzer, H. Xu, R. Guo, K.E. Thatcher, A.E. Bond, W. Wang, T. Nage, H. Shao, O. Kolditz
10:45	Coupling Clay Swelling Properties to Hydro-Geochemical Conditions: a Reactive Transport Modeling Approach Christophe Tournassat, Orléans France, Stéphane Gaboreau, Francis Claret, Carl Steefel
11:00	<i>Break</i>
Session 4: Fault Slip and Induced Seismicity (Chair: F. Plas)	
11:30	Complexity of Fault Rupture and Fluid Leakage in Shale: Insights from a Controlled Fault Yves Guglielmi, Christophe Nussbaum, Pierre Jeanne, Jonny Rutqvist, Frederic Cappa, Jens Birkholzer, Bastian Graupner
11:45	Results from an International Simulation Study of a Controlled Fault Activation Experiment at Mont Terri Laboratory Jonny Rutqvist, Bastian Graupner, Yves Guglielmi, Jens Birkholzer, Taehyun Kim, Jobst Maßmann, Thanh Son Nguyen, Jung-Wook Park, Wenjie Shiu, Luca Urpi, Jeoung Seok Yoon, Gesa Ziefle
12:00	Coupled Processes in Clay: Preliminary Results from Mont Terri CS-D and FS-B Experiments Antonio P. Rinaldi, Yves Guglielmi, Alba Zappone, CS-D/FS-B Collaboration Team
12:15	Development of EPCA3D and its Applications in Coupled THMC Processes in Geological Media Peng-Zhi Pan, Xia-Ting Feng, Peiyang Yu, Changyue Shao
12:30	The Role of Coupled Processes in Managing the Risk of Induced Seismicity in Geoenery Applications Stefan Wiemer, Alba Zappone, Dimitrios Karvounis, Anne Obermann, Antonio Pio Rinaldi
12:45	Coseismic Secondary Failure in Fractured Crystalline Rocks Triggered by Large Earthquake Events Qinghua Lei, Simon Loew
13:00	<i>Lunch</i>
Session 5: Cross-Cutting Topics and Emerging Methods (Chair: O. Kolditz)	
14:00	Far-From-Equilibrium Thermo-Hydro-Mechanical Multiphase Gas Transport in Hierarchical Porous Media Thomas Dewers, Teklu Hadgu, Yifeng Wang, Edward Matteo, Carlos Jove-Colon, Jason Heath, Nicolas Hayman
14:15	Lessons Learned in the Development of Source Term Surrogate Models for Repository Performance Assessment Paul E. Mariner, Bert J. Debusschere, D. Thomas Seidl, Laura P. Swiler, Jonathan Vo
14:30	Laboratory Study on the Volumetric Response of Gas Shale Samples with Controlled Pore Fluid Pressures Jinwoo Kim, Alessio Ferrari, Russell Ewy, Lyesse Laloui
14:45	Insights into Hydro-Mechanical Responses of a Crystalline Rock Mass During Hydraulic Stimulation Experiments Hannes Krietsch, Valentin Gischig, Joseph Doetsch, Mohammadreza Jalali, Linus Villiger, Florian Amann
15:00	Coupled Thermo-Hydro-Mechanical Simulations of a Supercritical Geothermal System F. Parisio, V. Vilarasa, W. Wang, O. Kolditz, T. Nagel
15:15	Experimental and Analytical Assessment of Draupne Shale Seal Integrity for CO₂ Storage Sites Magnus Soldal, Elin Skurtveit, Bahman Bohlooli, Heidi Debreczeny Wilkinson, Jung Chan Choi, Luke Griffiths, Halvard Smith
15:30	The Importance of Natural Rock Heterogeneity in Governing Transport During CO₂ Storage Sam Krevor
15:45	<i>Break</i>

Symposium Agenda

Tuesday, November 5, 2019 (continued)

Panel Discussion

16:15

Panel Format and Topics:

A Q&A discussion with moderators and audience asking questions to the panelists. There are some core themes identified below, but other topics may be discussed as well.

Remaining grand challenges in coupled processes modelling

The last quarter of a century has seen tremendous changes in coupled numerical analysis. Codes for representing such complex phenomena are no-longer restricted to specialist academic software; high-performance computing is rapidly approaching mainstream adoption; and more sophisticated field-scale studies of coupled processes have become available with an attendant wealth of data. At the same time, scientific understanding has continued to develop with much clearer methodologies and process understanding for representing a range of coupled systems. Given this development and the increasing need to understand complex processes in sub-surface engineering applications, what are the remaining "grand challenges" that face us as a community?

DECOVALEX 2050: What's next?

DECOVALEX has managed to remain relevant for over 25 years by being driven primarily by the funding organizations and their research needs. To date this focus has been primarily on sub-surface radioactive waste management. During this time the project has contributed significantly to the global understanding of geo-engineering and coupled processes, and while significant changes in the project organization have occurred, the fundamental project principles have remained the same. To keep relevant, and to exploit the platform of understanding and cooperation that has been established, DECOVALEX needs to continue to adapt. What should this project look like in 30 years time?

Translating our science into safety relevant outcomes

DECOVALEX has always been about cutting edge research, considering some of the most complex problems in geo-engineering. This research has been focused by the funding organizations and has ensured the relevance of the work to the funding organizations and the wider coupled process modelling community. Arguably this research, and the presentation of the research outcomes, could be better focused on ensuring those key safety or performance outcomes are characterized and communicated. Should DECOVALEX attempt to engage more in the way the research is used to understand safety and performance of complex geo-engineered systems?

Panelists:

- Simon Norris (RWM)
- Stefan Mayer (IAEA)
- Ann-Kathrin Leuz (ENSI)
- Lyesse Laloui (EPFL)
- Ki-Bok Min (Seoul National University)
- Jens Birkholzer (LBNL)

Moderators:

- Alex Bond (Quintessa)
- Chin-Fu Tsang (Uppsala University)

Closing Remarks

17:15

Symposium Co-Chairs: Bastian Graupner and Jens Birkholzer