



ALERT
Geomaterials

Alliance of Laboratories in Europe for Research and Technology
<http://alert.epfl.ch/>

22nd Alert Workshop and School
Aussois, October the 3rd to October the 8th 2011

Final Program &
List of Participants
(September 19th, 2011)



22nd Alert Workshop Program
Aussois, October the 3rd 2011

Session I: Multi-Scale Geomechanics: From Fabric to Material Properties

Coordinators: Gary Couples (Heriot-Watt University), Bruno Chareyre (INPG)

- 8:30 – 8:40 Opening of the 22nd ALERT Workshop**
F. Darve (INPG), President of ALERT
- 8:40 Morning session opening**
G. Couples, B. Chareyre
- 8:40 – 9:05 Continuum/micro-structural second gradient models: application to Terzaghi consolidation**
A. Madeo¹, F. Dell'Isola² (¹INSA Lyon, ²Sapienza Università di Roma)
- 9:05 – 9:30 Modelling of lime treatment effects on soils using level set enhanced computational tools**
B. Sonon, M.A. Hashemi, F. Bertrand, T. Massart (Univ. Libre de Bruxelles)
- 9:30– 9:55 Double structure effects on the chemo-hydro-mechanical behaviour of a compacted active clay**
M. Guido, E. Romero, G. della Vecchia (Politecnico di Torino)
- 9:55 – 10:20 A microstructure analysis of the water retention properties of a natural loess**
J. Munoz-Castelblanco, P. Delage, J.M. Pereira, Y.J. Cui (Navier/CERMES)
- 10:20 – 10:40 COFFEE BREAK**
- 10:40 – 11:15 Invited presentation**
Fabric evolution and dynamical patterns in sand to molten planetesimals: does form follow function or vice versa?
A. Tordesillas (University of Melbourne)
- 11:15 - 11:40 A micromechanically derived micropolar elastoplastic model for granular materials**
E. Gerolymatou (National Technical University of Athens)
- 11:40 – 12:05 Stress probing via DEM simulations for the identification of plastic mechanisms of a model granular material under stress axis rotation**
F. Froio¹, J.-N. Roux² (¹Ecole Centrale de Lyon, ²Navier)

12:30 – 14:30 LUNCH

14:30 Afternoon session opening

G. Couples, B. Chareyre

14:30 – 15:10 Invited presentation

Invited overview of network flow methods

R. van Dijke, A. Ryazanov, K. Wu, Z. Jiang, J. Ma, K.S. Sorbie, S. McDougall, G. Couples (Herriot-Watt Univ.)

15:10 – 15:35 Predicting the fluid-flow characteristics of a deformed sandstone

E.-M. Charalampidou, K. Wu, Z. Jiang, R. van Dijke, H. Lewis, G. Couples (Herriot-Watt Univ.), S. Hall, C. Viggiani (Univ. Grenoble)

15:35 – 16:00 Microscale modelling for the study of hydromechanical properties of geomaterials

E. Catalano, B. Chareyre, A.T. Tong, E. Barthélémy (Grenoble Instit. of Technology)

16:00 – 16:25 Numerical modelling of underwater avalanches

P. Mutabaruka¹, J-Y. Delenne¹, F. Radjai¹, S. Kenich² (¹Univ. Montpellier 2, ²Univ. of Cambridge)

16:25 – 16:50 COFFEE BREAK

16:50 – 17:15 Microstructure characterisation of Canadian Oil sands

D.H. Doan¹, P. Delage², J.F. Nauroy¹, S. Youssef¹, E. Rosenberg¹, H. Marmet¹, A.M. Tang¹ (IFP), M. Mainguy¹ (¹IFP, ²Navier, ³Total)

17:15 – 17:40 Experimental determination of the Constriction Size Distribution for granular filters

J. Sjah, E. Vincens (Ecole Centrale de Lyon)

17:40 – 18:40 ALERT General Assembly

18:40 – 19:00 A Summary on the 5th ALERT Poster Session

A. Seiphoori (Swiss Federal Institute of Technology)

19:00 – 19:45 Poster Session (intermediate level) and aperitif

20:00 DINNER



22nd Alert Workshop Program Aussois, October the 4th 2011

Session II: Geomechanical issues in CO₂ storage

Coordinators: Gilles Pijaudier-Cabot (Université de Pau et des Pays de l'Adour)
Jean-Michel Pereira (Ecole des Ponts ParisTech)

8:30 Morning session opening

G. Pijaudier-Cabot, J.M. Pereira

8:30 - 9:05 Invited presentation

Assessing the sealing efficiency of caprocks for CO₂ geological storage purposes

D. Broseta, N. Tonnet (Université de Pau et des Pays de l'Adour)

9:05 - 9:30 Unstructured grid simulation of hydromechanical effects in fractured reservoirs during CO₂ injection

R. Annewandter¹, S. Geiger¹, I. Main², S. Matthai³ (¹Heriot-Watt University, ²University of Edinburgh, ³Montan University)

9:30 - 9:55 Microseismicity illuminates open fractures in the shallow crust

R. Lunn¹, S. Pytharouli¹, Z. Shipton¹, J. Kirkpatrick², A. Farias do Nascimento³ (¹University of Strathclyde, ²University of California Santa Cruz, ³Universidade Federal do Rio Grande do Norte)

9:55 - 10:20 Numerical analysis of the gas migration mechanisms in clayey rocks in the context of radioactive waste disposal

P. Gérard, F. Collin, J.-P. Radu, R. Charlier (Université Liège)

10:20 – 10:40 COFFEE BREAK

10:40 – 11:05 Fluid Leakage from Pressurized Storage Formations

A.P.S. Selvadurai (McGill University)

11:05 - 11:30 Quantifying magnitudes and rates of CO₂ leakage from natural analogues: implications for monitoring and remediation techniques for geological CO₂ storage

N. M. Burnside¹, Z. K. Shipton¹, B. Dockrill², R. Ellam³ (¹University of Glasgow, ²Chevron, ³SUERC)

11:30 - 11:55 Some attempts to upscale mass transfer properties from pore size distributions in porous materials

F. Khaddour, D. Grégoire, G. Pijaudier-Cabot (Université de Pau et des Pays de l'Adour)

11:55 - 12:20 CO₂ storage in coal seams: A reservoir model which couples adsorption and strain

S. Nikoosokhan, M. Vandamme, P. Dangla (Laboratoire Navier, Marne-la-Vallée)

12:30 – 14:30 LUNCH

14:30 Afternoon session opening

G. Pijaudier-Cabot, J.M. Pereira

14:30 - 15:05 Invited presentation

A non-local damage model for heterogeneous rocks – application to rock fracturing evaluation under gas injection conditions

D. Seyedi¹, N. Guy^{1,2,3}, F. Hild², S. Meunier⁴, S. Granet⁴ (¹BRGM, ²LMT-Cachan, ³now at IFPEN, ⁴EDF R&D)

15:05 - 15:30 Poromechanics of microporous solids – thermodynamics based modelling

R. Vermorel, G. Pijaudier-Cabot, C. Miqueu, B. Mendiboure, D. Grégoire (Université de Pau et des Pays de l'Adour)

15:30 - 15:55 Contribution to the understanding of chemo-mechanical coupling in soils

J. Lewandowska (Université Montpellier 2)

15:55– 16:20 A macroscopic modeling of continuous decalcification of CSH in the context of the carbonation of cement-based materials

J. Shen¹, P. Dangla¹, M. Thiery² (¹Laboratoire Navier, Marne-la-Vallée, ²IFSTTAR)

16:20 - 16:45 Influence of chemical degradation on mechanical behaviour and permeability of a petroleum cement paste

I. Yurtdas¹, S.Y. Xie¹, N. Burlion¹, J.F. Shao¹, J. Saint-Marc², A. Garnier² (¹Université Lille, ²Total)

16:45– 17:15 COFFEE BREAK

17:15 – 18:00 Alert PhD Prize 2011

18:00 – 19:00 Alert Invited Lecture 2011:

Plasticity of Geomaterials in a Variable Environment

Prof. Tomasz Hueckel

(Department of Civil and Environmental Engineering, Duke University, Durham)

Discussion

19:00 Alert Board of Directors

20:30 Banquet



22nd Alert Workshop Program Aussois, October the 5th 2011

Session III: Localized versus diffuse failure in geomaterials

Coordinators: Michael Hicks (TU Delft), Gioacchino Viggiani (UJF Grenoble)

8:40 Morning session opening

M. Hicks, G. Viggiani

8:40 – 9:15 Invited Lecture

Anatomy of granular failure: the how, why and what of diffuse versus localized modes

A. Tordesillas (University of Melbourne)

9:15 - 9:40 Finite element simulation of strain localization in unsaturated soils

P. Arnold, M. Hicks (TU Delft)

9:40 - 10:05 Borehole stability in fluid saturated chalk

E. Papamichos¹, R. Flatebo², T. G. Kristiansen² (¹Aristotle University of Thessaloniki, ²BP Norge)

10:05 - 10:30 Characterization of the strain localization in a porous rock in plane strain condition using a new true-triaxial apparatus

P. Bésuelle¹, S. Hall² (¹INP Grenoble, ²Lund University)

10:30 – 10:50 COFFEE BREAK

10:50 – 11:15 Diffuse failure mechanism in a vertical breakwater foundation induced by impulsive sea wave actions

M.M. Stickle, M. Pastor, P. Dutto (Universidad Politécnica de Madrid)

11:15 - 11:40 Micro-structural basis of the second-order works in granular media

F. Nicot¹, N. Hadda¹, F. Bourrier¹, L. Sibille², F. Radjai³, F. Darve⁴ (¹CEMAGREF, ²Université de Nantes, ³Université Montpellier 2, ⁴G-INP Grenoble)

11:40 - 12:05 Experimental analysis of diffuse failure in loose sands under different loading paths

A. Daoudji¹, M. Jrad¹, B. Sukumaran², F. Darve³ (¹Université Paul Verlaine, ²Rowan University, ³G-INP Grenoble)

12:05 - 12:30 Shear strength of soft soils from mining deposits

I. Herle¹, D. Mašín², V. Kostkanová³, C. Karcher⁴, (¹TU Dresden, ²Charles University Prague, ³Academy of Sciences of the Czech Republic, Prague, ⁴RWE Power AG, Köln)

12:30 – 14:00 LUNCH

14:00 Afternoon session opening

M. Hicks, G. Viggiani

14:00 - 14:35 Invited Lecture

Failure modes observed in submarine landslides

K. Soga (University of Cambridge)

14:35 - 15:00 Modelling the post-failure stage for rainfall-induced landslides of the flow-type

S. Cuomo¹, L. Cascini¹, M. Pastor² (¹Università di Salerno, ²Universidad Politécnica de Madrid)

15:00 - 15:25 Full-field characterization of localized deformation and damage in soft granular rock

E. Tudisco¹, S. Hall², G. Viggiani³, P. Roux⁴ (¹INP Grenoble, ²Lund University, ³Università di Roma Tor Vergata, ⁴CNRS Grenoble)

15:25 - 15:50 The role of the characteristic length in the propagation of compaction bands in high porosity cemented materials

G. Dattola¹, I. Redaelli¹, C. di Prisco¹, S. Utili² (¹Politecnico di Milano, ²University of Oxford)

15:50 - 16:15 Excavation damage zone and permeability evolution modelling in indurated clays based on a micromechanical approach

S. Levasseur¹, F. Collin¹, R. Charlier¹, D. Kondo² (¹Université de Liège, ²Université Pierre et Marie Curie, Paris)

16:15 – 16:45 COFFEE BREAK

20:00 DINNER



22nd Alert Doctoral School
October, Thursday 6th 2011

Prevention and protection against hazard:

Some issues on seismic and gravitational risk

Coordinators:

Claudio di Prisco (Politecnico di Milano)

Yann Malècot (Université Joseph Fourier)

08:30 – 08:45 **Introduction: Content and structure of the school**
Claudio di Prisco, Yann Malècot

Gravitational Risks

08:45 – 10:45 **1 Risk assessment**
Laurent Vuillet (École Polytechnique Fédérale de Lausanne)

10:45 – 11:15 **COFFEE BREAK**

11:15 – 12:30 **2 Snow, avalanches and protection structures - Part I**
François Nicot (CEMAGREF)

12:30 – 14:30 **LUNCH**

14:30 – 15:45 **3 Snow, avalanches and protection structures - Part II**
François Nicot (CEMAGREF)

15:45 – 16:15 **COFFEE BREAK**

16:15 – 18:00 **4 Evolution of fast landslides - Part I**
Manuel Pastor (Centro de Estudios y Experimentacion de Obras Publicas)

20:00 **DINNER**



22nd Alert Doctoral School
October, Friday 7th 2011

Prevention and protection against hazard:

Some issues on seismic and gravitational risk

Coordinators:

Claudio di Prisco (Politecnico di Milano)

Yann Malècot (Université Joseph Fourier)

- 8:30 – 9:30** **5 Evolution of fast landslides - Part II**
Manuel Pastor (Centro de Estudios y Experimentacion de Obras Publicas)
- 9:30 – 11:00** **6 Sheltering structures - Part I**
Francesco Calvetti (Politecnico di Milano)
- 11:00 – 11:30** **COFFEE BREAK**
- 11:30 – 12:30** **7 Sheltering structures - Part II**
Francesco Calvetti (Politecnico di Milano)
- 12:30 – 14:30** **LUNCH**
- 14:30 – 16:00** **7 Concrete structures under impact - Part I**
Laurent Daudeville (Université Joseph Fourier)
- 16:00 – 16:30** **COFFEE BREAK**
- 16:30 – 17:30** **8 Concrete structures under impact - Part II**
Laurent Daudeville (Université Joseph Fourier)
- 20:00** **DINNER**



22nd Alert Doctoral School
October, Saturday 8th 2011

Prevention and protection against hazard:

Some issues on seismic and gravitational risk

Coordinators:

Claudio di Prisco (Politecnico di Milano)

Yann Malècot (Université Joseph Fourier)

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| 08:30 – 10:30 | 9 Seismic loading
<i>Pierre Yves Bard (Université Joseph Fourier)</i> |
| 10:30 – 11:00 | COFFEE BREAK |
| 11:00 – 12:30 | 10 Soil-structure interaction - Part I
<i>Claudio di Prisco (Politecnico di Milano)</i> |
| 12:30 – 14:00 | LUNCH |
| 14:00 – 14:45 | 11 Soil-structure interaction - Part II
<i>Claudio di Prisco (Politecnico di Milano)</i> |
| 14:45 – 15:30 | 12 Structural response - Part I
<i>Jacky Mazars (Institut National Polytechnique de Grenoble)</i> |
| 15:30 – 16:00 | COFFEE BREAK |
| 16:00 – 17:15 | 13 Structural response - Part II
<i>Jacky Mazars (Institut National Polytechnique de Grenoble)</i> |
| 17:15 – 17:30 | SCHOOL CLOSURE BY THE COORDINATORS |