

CURRICULUM VITAE (OCT. 2009)

BERTRAND FRANÇOIS

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Born November 3, 1981 in Charleroi (Belgium)
Single, Belgian

EDUCATION

- 01.2005-08.2008 :** **PhD thesis :** "Thermo-plasticity of fine-grained soils at various saturation states: Application to nuclear waste disposal"
Ecole Polytechnique Fédérale de Lausanne (EPFL) - Soil Mechanics Laboratory (LMS)
PhD director: Prof. L. Laloui
- 09.2004 :** **Civil Engineer diploma**
Université de Liège (Ulg)
- 02.2004-06.2004 :** **Master thesis :** "Numerical modelling of the hydro-mechanical behaviour of Triesenberg's landslide (Liechtenstein)"
Ecole Polytechnique Fédérale de Lausanne (EPFL)
Supervisors: Prof. L. Laloui, Ch. Bonnard, Prof. R. Charlier
- 09.1999-09.2004 :** **Bachelor and Master studies :** Civil Engineering
Université de Liège (Ulg)

PROFESSIONAL EXPERIENCE

- 10.2009-Present :** **Post-Doctoral researcher :** "Study of the anisotropic character of multiphysics processes in soils and rocks. Experimental characterisation and modelling".
Université de Liège (Ulg) – ArGENCo department
- 09.2008-10.2009 :** **Post-Doctoral researcher :** "Multi-scale modeling of time-dependent failure in clay rock based on sub-critical crack propagation".
Institut National Polytechnique Grenoble (INPG) – Laboratoire 3S-R
- 09.2004-06.2008 :** **Teaching assistant**
Ecole Polytechnique Fédérale de Lausanne (EPFL) - Soil Mechanics Laboratory (LMS)
"Soil Mechanics" - Civil Engineering - Teacher: Prof. L. Vulliet
"Geotechnics and Foundations" - Environmental Engineering - Teacher: Dr. M. Gencer
"Underground Seepage" - Civil Engineering - Teacher: Prof. L. Laloui
- 09.2004-12.2004 :** **Research assistant**
Ecole Polytechnique Fédérale de Lausanne (EPFL) - Soil Mechanics Laboratory (LMS)

AWARDS AND HONORS

10.2009

ALERT PhD Prize 2009

Award of the best European PhD thesis of 2009 in Geomechanics granted by the Alliance of Laboratories in Europe for Research and Technology - Geomaterials

SKILLS

Languages :

French

Mother tongue

English

Fluent written, oral and academic writing

Dutch

Basic notions written and oral

Computers :

Classical software

Word, Excel, PowerPoint, Illustrator, Photoshop, Tex-Latex.

Finite element code dedicated to soil mechanics

Z_SOIL, Lagamine, FEAP, COMSOL

Programming

FORTRAN, MATLAB

Additional skills : Laboratory experiments in soil mechanics

SCIENTIFIC PUBLICATIONS

International journals :

1. Laloui L., Cekerevac C., **François B.** (2005) Constitutive modelling of the thermo-plastic behaviour of soils. *Revue Européenne de Génie Civil* 9, 5-6, pp.635-650.
2. **François B.**, Tacher L., Bonnard C., Laloui L., Triguero V. (2007) Numerical modelling of the hydrogeological and geomechanical behaviour of a large slope movement: The Triesenberg landslide (Liechtenstein). *Canadian Geotechnical Journal* 44(7) - pp. 840-857.
3. **François B.**, Laloui L. (2008) ACMEG-TS: A constitutive model for unsaturated soils under non-isothermal conditions. *International Journal for Numerical and Analytical Methods in Geomechanics*, 32, pp 1955-1988.
4. Sanavia L., **François B.**, Bortolotto R., Luison L., Laloui L. (2008) Finite element modelling of thermo-elasto-plastic water saturated porous materials. *Journal of Theoretical and Applied Mechanics*, 38, 1-2, pp 7-34.
5. Salager S., **François B.**, El Youssoufi M.S., Laloui L., Saix C. (2008) Experimental investigations on temperature and suction effects on compressibility and pre-consolidation pressure of a sandy silt. *Soils and Foundations* 48(4), pp. 453-466.
6. **François B.**, Laloui L., Laurent C. (2009) Thermo-hydro-mechanical simulation of ATLAS in situ large scale test in Boom Clay. *Computers and Geotechnics*. 36(4), pp. 626-640.
7. Hueckel T., **François B.**, Laloui L. (2009). Explaining thermal failure in saturated clays. *Géotechnique* 59(3), pp. 197-212.
8. Laloui L., **François B.** (2009) ACMEG-T: A soil thermo-plasticity model. *Journal of Engineering Mechanics*. DOI:10.1061/(ASCE)EM.1943-7889.0000011.
9. Dascalu C., **François B.**, Keita O. (2009). A two-scale model for subcritical damage propagation. *International Journal of Solids and Structures*. in press.

10. **François B.**, Laloui L. (2009). An oedometer for studying combined effects of temperature and suction on soils. *Geotechnical Testing Journal*. Submitted.
11. **François B.**, Laloui L. (2009). Multiphysical plastic analysis of the FEBEX experiment for nuclear underground storage. *International Journal of Rock Mechanics and Mining Sciences*. Submitted.

Chapter of books :

1. **François B.**, Bonnard Ch., Laloui L., Triguero V. (2006) Numerical modeling of the hydro-mechanical behaviour of a large slope movement: the Triesenberg landslide. *In: Numerics in geotechnics and structures, Eds. T. Zimmermann & A. Truty, Elmepress Int.*, pp. 81-102.

Conference proceedings :

1. **François B.**, Laloui L.* (2007) A stress-strain framework for modelling the behaviour of unsaturated soils under non-isothermal conditions. *Springer Proceedings in Physics 113, Theoretical and Numerical Unsaturated Soils Mechanics*, pp. 119-126
2. **François B.***, Salager S., El Youssoufi M. S., Ubals Picanyol D., Laloui L., Saix C. (2007) Compression tests on a sandy silt at different suction and temperature levels. *ASCE Geotechnical Special Publication 157*.
3. **François B.**, Nuth M.*, Laloui L. (2007) Mechanical constitutive framework for thermal effects on unsaturated soils. *Proceeding of the 10th Int. Symp. on Numerical Models in Geomechanics, NUMOG X, Rhodes, Greece*, pp. 9-13.
4. **François B.**, Laloui L. (2007) A fully coupled thermo-mechanical model for unsaturated soil. *2nd International Conference on Porous Media and its Applications in Science, Engineering and Industry, Hawaai*.
5. **François B.***, Laloui L. (2008) Unsaturated soils under non-isothermal conditions: Framework of a new constitutive model. *GeoCongress08, New Orleans, USA*.
6. **François B.*** (2008) Un modèle de comportement thermo-plastique pour les sols non-saturés: Application aux stockages de déchets nucléaires. *26eme Rencontres Universitaires de Génie Civil, Prix René Houpert, Nancy*.
7. Laloui L.*, **François B.**, Nuth M., Peron H., Koliqi A. (2008) A thermo-hydro-mechanical stress-strain framework for modelling the performance of clay barriers in deep geological repositories for radioactive waste. *1st European Conf. on Unsaturated Soils, Durham, United Kingdom*, pp 63-80.
8. **François B.***, Laloui L. (2008) ACMEG-TS: A unified elasto-plastic constitutive model to simulate coupled processes in non-isothermal unsaturated soils. *1st European Conf. on Unsaturated Soils, Durham, United Kingdom*, pp. 539-545.
9. **François B.**, Bonnard Ch., Laloui L.* (2008) Investigation of the geomechanical aspects of a large landslide by means of a finite-element method: a case study. *12th IACMAG Conference. Goa, India*, pp. 4577-4585.
10. Laloui L.*, **François B.** (2008) Numerical simulation of an in-situ underground experiment for nuclear waste storage. *12th IACMAG Conference. Goa, India*, pp. 2345-2355.
11. **François B.***, Laloui L. (2008) Thermo-plasticity of soils at various saturation states: a constitutive model. *3rd International Workshop of Young Doctors in Geomechanics, Paris*, pp. 7-10.
12. **François B.**, Laloui L.* (2009) Behaviour of an engineered clay barrier involved in a prospective nuclear waste isolation system. *1st International Symposium on Computational Geomechanics (ComGeo I), Juan-les-Pins, France*, pp. 422-433.

13. **François B.***, Dascalu C., Operchalska B. (2009) A time-dependent multi-scale damage model for rocks based on sub-critical growth of micro-cracks. *1st International Symposium on Computational Geomechanics (ComGeo I), Juan-les-Pins, France*, pp. 38-48.
14. Hueckel T.*, Laloui L., **François B.** (2009) Implications of thermal sensitivity of the static internal friction angle. *1st International Symposium on Computational Geomechanics (ComGeo I), Juan-les-Pins, France*, pp. 104-115.
15. **François B.**, Laloui L.* (2009) Behaviour of an engineered clay barrier for A nuclear waste isolation system. *Int. Conf. on Computational Methods for Coupled Problems in Science and Engineering, Coupled Problems'09, Ischia, Italy*.
16. Sanavia L.*, Laloui L., Passarotto M., Luison L., **François B.** (2009) Coupled hydro-thermo-mechanical analysis of a deep radioactive waste disposal based on porous media mechanics. *Int. Conf. on Computational Methods for Coupled Problems in Science and Engineering, Coupled Problems'09, Ischia, Italy*.

Extended abstracts and posters:

1. Laloui L.* and **François B.** (2006) A THM stress-strain framework for modelling the performance of argillaceous materials in deep repositories for radioactive waste. *Mont Terri, 10 years anniversary workshop, St-Ursanne, Switzerland*.
2. Laloui L. and **François B.** (2007) New insights in the thermomechanical modelling of soils. *International Conference on Thermo-Mechanical Modeling of Solids, Paris*.
3. **François B.**, Nuth M., Laloui L. (2007) A constitutive approach to address the thermal and hydric impacts in the concept of deep radioactive waste repositories. *3rd international meeting on Clays and Natural and Engineered Barriers for Radioactive Waste Confinement, Lille, France*.
4. Luison L., **François B.***, Bortolotto R., Sanavia L., Laloui L. (2007) Finite element modelling of thermo-elasto-plastic water saturated porous materials. *18th ALERT Workshop, Poster Session, Aussois, France*.
5. Laloui L., **François B.*** (2008) Thermo-hydro-mechanical simulation of Atlas in situ large-scale test in Boom clay. *19th ALERT Workshop, Session Multiphysics of Multiphase Materials. Aussois, France*.
6. **François B.**, Laloui L.* (2009) Behaviour of an engineered clay barrier for a nuclear waste isolation system. *Int. Conf. on Computational Methods for Coupled Problems in Science and Engineering. Ischia Island, Italy*.
7. Dizier A., Collin F., Garitte B., **François B.**, Chen G.J., Sieffert Y., Labiouse V., Charlier R., Chambon R. (2009) Thermo-hydro-mechanical modelling of hollow cylinder laboratory experiments on Boom and Opalinus Clays. *Int. Conf. on Impact of thermo-hydro-mechanical-chemical processes on the safety of underground radioactive waste repositories. Luxembourg*.
8. Passarotto M., Luison L., Sanavia L., Laloui L., **François B.*** (2009). Coupled hydro-thermo-mechanical analysis of a deep radioactive waste disposal based on porous media mechanics. *20th ALERT Workshop, Poster Session, Aussois, France*.

PhD thesis :

- François B.** (2008) Thermo-plasticity of fine-grained soils at various saturation states: Application to nuclear waste disposal. *PhD Thesis N°4188, EPFL, Lausanne*.

Master thesis :

- François B.** (2004) Modélisation numérique du comportement hydro-mécanique de la zone instable du versant de Triesenberg (Liechtenstein). *Master Thesis, EPFL, Lausanne*.