4th European Conference on Unsaturated Soils
19 to 21 October 2020

ONLINE conference

FINAL PROGRAMME
# FINAL PROGRAMME

<table>
<thead>
<tr>
<th>Lisbon time - 5h</th>
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<th>19th October</th>
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<td>04:00</td>
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<td>Opening session</td>
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<td>Codes of Practice</td>
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Detailed description in the next pages

Oral presentation of all papers (10 minutes) followed by discussion (2-5 minutes/paper).

Final Programme also available at: https://eunsat2020.tecnico.ulisboa.pt/news/default.html

**PAY ATTENTION: all hours below are Lisbon time!**

Please see the correspondence between the number of paper from easychair and the number of paper in the proceedings book at the end of this document.

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**PROCEEDINGS**

The proceedings of E-UNSAT 2020 are available online at: www.e3s-conferences.org.

E3S Web of Conferences

Volume 195 (2020)

4th European Conference on Unsaturated Soils (E-UNSAT 2020)

Lisboa, Portugal, October 19-21, 2020

R. Cardoso, C. Jommi and E. Romero (Eds.)

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**SPONSORS**
Monday 19th October

**PLENARY SESSION**

**OPENING**
Rafaela Cardoso and the President of DECivil of IST

**TC106 - 2nd European Distinguished Lecturer on Unsaturated Soils**
**Chair:** David Toll

New research topics in experimental unsaturated soil mechanics. Hydro-mechanical behaviour of compacted vegetated soils.  
*Enrique Romero,* UPC, Barcelona, Spain

**BREAK**

**PARALLEL SESSIONS**

**S1**
**Chair:** Maria Victoria Villar

| 04001 | Numerical simulation of a water infiltration test on a proposed backfill material in nuclear waste repositories  
*Abhishek Rawat, Anne Catherine Dieudonne, Wiebke Baille and Frederic Collin*
| 04002 | Development of a THMC code for bentonites in Comsol Multiphysics  
*Angel Yustres, Rubén López-Vizcaíno, Virginia Cabrera and Vicente Navarro*
| 04003 | Hydro-mechanical behaviour of binary bentonite pellet and powder mixtures  
*Arisleidy Mesa Alcantara, Enrique Romero, Nadia Mokni and Sebastia Olivella*
| 04004 | Modelling of oedometer tests on pellet-powder bentonite mixtures to support mock-up test analysis  
*Arisleidy Mesa Alcantara, Nadia Mokni, Enrique Romero and Sebastia Olivella*
| 04006 | A coupled hydro – mechanical approach for modelling the volume change behaviour of compacted bentonite  
*Jose A. Bosch, Alessio Ferrari and Lyesse Laloui*
| 04009 | Hydro-mechanical behaviour of a pellets based bentonite seal: Numerical modelling of lab scale experiments  
*Liliana Gramegna, Robert Charlier, Jean Talandier, Frederic Collin and Christophe Imbert*
| 02006 | Modelling the hydromechanical behaviour of expansive granular mixtures upon hydration  
*Benjamin Darde, Anh Minh Tang, Jean-Michel Pereira, Jean-Noël Roux, Patrick Dangla, Jean Talandier and Minh Ngoc Vu*
S2 - Special session on the reuse of geomaterials

Chair: Olivier Cuisinier

06001 Use of class C fly ash for stabilization of fine grained soils
  Canan Turan, Akbar Javadi, Raffaele Vinai, Nader Shariatmadari and Raziyeh Farmani

06002 Characterisation of geomaterials and non-conventional waste streams for their reuse as engineered materials
  Claudio Oggeri and Raffaele Vinai

06003 Hydro-mechanical behaviour of alkali-activated binder treated soil
  Enza Vitale, Antonello Marocco, Michael Khatib and Giacomo Russo

06004 Water retention curves of lightweight cemented soils
  Enza Vitale, Olivier Cuisinier, Giacomo Russo, Dimitri Deneele, Domenico De Sarno, Marco Valerio Nicotera, Raffaele Papa and Gianfranco Urciuoli

06005 Biochar for the improvement of soil and rock with acid potential
  Erlend Sørmo, Erika Kämäräinen, Matilda Edvardsson and Christian Maurice

06006 Amelioration of permeable soil with green liquor dregs for the construction of sealing layers for mine waste storage facilities
  Ida Kronsell, Susanne Nigéus, Anna Virolainen, Yu Jia, Thomas Pabst and Christian Maurice

06007 Experimental study on the effect of chitosan biopolymer on sandy soil stabilization
  Nader Shariatmadari, Mohammad Reza Amiri Tasuji, Pooria Ghadir and A. Akbar Javadi

06008 Impact of successive wetting and drying cycles on the hydromechanical behaviour of a treated soil
  Olivier Cuisinier

06009 Hydromechanical properties and microstructure of a kaolin treated with vinyl-based copolymer
  Olivier Cuisinier, Alper Sezer, Sossio Fabio Graziano and Giacomo Russo
19/10/2020 Morning 10h45 - 12h15

S3
Chair: Antonio Gens

01027 Numerical study of the application of capillary barrier systems for prevention of rainfall-induced slope instabilities
   Riccardo Scarfone, Simon Wheeler and Colin Smith

01030 Performance of a driven battered mini-pile group against expansive soil induced ground movement
   Shirin Aminzadeh Bostani Taleshani, Robert Evans, Emad Gad and Mahdi Miri Disfani

01028 Coupled hydro-mechanical modelling of a 1995 Hong Kong landslide
   Sabatino Cuomo, Angela Di Perna and Mario Martinelli

01025 Hydro-mechanical modelling of rammed earth structures
   Parul Chauhan, Elio Moussa, Noémie Prime, Olivier Plé and Simon Wheeler

   Michail Bardanis and Dimitrios Loukidis

01024 Fully-coupled analysis for the behaviour of flexible retaining structures under seismic conditions
   Nicola Pontani, Kateryna Oliynyk and Claudio Tamagnini

01019 Water retention and characteristic curves representing tropical clay soils from Africa
   Khalid Alhaj Abdalla, Giovanna Biscontin, Mohamed Elshafie and Ashraf Osman

LUNCH BREAK

PLENARY SESSION 19/10/2020 Afternoon 13h30 - 14h30

KEYNOTE 1
Chair: Marcelo Sanchez

Bentonite clay barriers in nuclear waste repositories.
   Lyesse Laloui, EPFL Lausanne, Switzerland

BREAK
### PARALLEL SESSIONS

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**Chair:** Laureano Hoyos

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<td>03037</td>
<td>Cyclic behavior of an unsaturated silty soil subjected to hydro-mechanics damages</td>
<td>Tomoyoshi Nishimura</td>
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<td>Very-small to large strain dynamic behaviour of unsaturated sand in a wide range of suction</td>
<td>Ali Akbar Karimzadeh and Anthony Kwan Leung</td>
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<td>03018</td>
<td>Cyclic mechanical loading of silty clay soils</td>
<td>Henok Hailemariam and Frank Wuttke</td>
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<td>03007</td>
<td>Evaluating the Maximum Shear Modulus ($G_0$) for different bender-soil coupling energies</td>
<td>Caio de Mattos Azevedo de Paula and Thiago de Souza Carnavale</td>
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<td>01005</td>
<td>Centrifuge tests to evaluate the effect of depth of water table on seismic response of shallow foundations on silty sands</td>
<td>Amin Borghei, Majid Ghayoomi and Matthew Turner</td>
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**Chair:** Snehasis Tripathy

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<td>02005</td>
<td>Modelling of unsaturated gas flow by Thebes code: Validation tests</td>
<td>Ayman Abed and Wojciech Solowski</td>
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<td>02017</td>
<td>A frost heave model of unsaturated coarse-grained soil considering vapour transfer</td>
<td>Jianlong Liu, Jidong Teng, Sheng Zhang and Daichao Sheng</td>
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<td>02027</td>
<td>Modelling free gas overpressure in peat layers</td>
<td>Stefano Muraro and Cristina Jommi</td>
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<td>04008</td>
<td>Gas transport in compacted bentonite and their coupled hydro-mechanical interactions</td>
<td>Laura Gonzalez Blanco, Enrique Romero and Paul Marschall</td>
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19/10/2020 Afternoon 14h45 - 15h45

**S6**

**Chair:** Gilson Gitirana Jr.

03042 Hydromechanical behaviour of hydrophobised soils of varying degrees of saturation: a comprehensive review
*Zheng Zhou and Anthony Leung*

03039 Hydrophobisation of clays and nano silica for ground engineering
*Yunesh Saulick and Sérgio Lourenço*

02030 Water-entry pressure in water repellent soils: a review
*Xin Xing and Sérgio Lourenço*

03040 Effect of wetting and drying on menisci structures in hydrophobic sands
*Zeynep Karatza, Jim Buckman, Gabriela Medero and Christopher Thomas Stone Beckett*

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**BREAK**

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**PARALLEL SESSIONS**

19/10/2020 Afternoon 16h00 - 17h00

**S7**

**Chair:** Natasa Stambuk Cvitanovic

03009 An Estimation of the Soil Water Characteristics Curves of Trinidad's Expansive Clays
*Damian Alexander, Kyung Park and Derek Gay*

03027 Comparison between Soil-Water Characteristic Curves based on filter paper method and grain-size distribution/volume-mass prediction: An evaluation of input data stemmed from hydrometer and Cilas grain-size analyser.
*Marcos Felipe da Silva André and Thiago de Souza Carnavale*

02002 Exponential Functions for Modelling Hysteresis of Soil-Water Characteristic Curves
*Alfrendo Satyanaga, Jong Kim, Sung-Woo Moon and Martin Wijaya*

02010 Determination of soil water retention curve: an artificial intelligence-based approach
*Ehsan Nikooee, Amir Mohammad Nouri, Alireza Ghadamgahi Khorassani, Rasoul Mirghafari and Ghassem Habibagahi*

02024 Evaluation of prediction models applied to the soil-water characteristic curve of ideal materials
*Roberto Alves, Gilson Gitirana and Sai Vanapalli*
S8
Chair: Giacomo Russo

01016 Leachate production estimation for a landfill in south of Brazil using Hydrus-1D
Jonathan Tenório and Débora Hianca Da Rosa Waiczik

03028 A comparative assessment of chemical stabilisers including waste materials, for the
treatment of swelling-shrinking soils
Maria Mavroulidou, Christopher Gray, Fortunate Gumbochuma and Michael Gunn

03004 Effect of Coal on Mine Tailings’ Water Permeability and Water Retention
Andrew Vidler, Stephen Fityus and Olivier Buzzi

02003 M4EKR, Multiphysics for ElectroKinetic Remediation of Polluted Soils
Angel Yustres, Rubén López-Vizcaíno, Virginia Cabrera and Vicente Navarro

S9
Chair: Anna Ramón

01018 Rainfall infiltration simulation on embankment containing soluble material
Katsuyuki Kawai, Kaito Arinishi, Satsuki Kataoka and Koji Nakashima

01004 A numerical study on the effect of salinity on the stability of an unsaturated railway
embankment under rainfall
Ali Kolahdooz, Hamed Sadeghi and Mohammad Mahdi Ahmadi

01026 Unsaturated Seepage Analysis at Guayabo’s Archaeological Site, Costa Rica
Rafael Baltodano-Goulding

01033 Hydro-mechanical behaviour of a sandy silt from a river embankment
Vincenzo Butticè, Alessio Ferrari, Carmine Gerardo Gragnano and Guido Gottardi

02026 A semi-empirical model to predict excess pore pressure generation in partially
saturated sand
Sayedmasoud Mousavi and Majid Ghayoomi
Tuesday 20th October

PLENARY SESSION 20/10/2020 Morning 9h00 - 10h30

PANEL SESSION: CODES OF PRACTICE
Chair: Simon Wheeler

Unsaturated soils and Eurocodes
Marcos Arroyo, UPC Barcelona, Spain

The use of unsaturated soil mechanics in engineering practice: Codes and current trends in Australia
Adrian Russell, UNSW, Australia

Opportunities for unsaturated soil mechanics in the geotechnical practice: a few case histories
Cristina Jommi, TUDelft, The Netherlands

BREAK

PARALLEL SESSIONS 20/10/2020 Morning 10h45 - 12h15

S10
Chair: Rafaela Cardoso

01001 Effect of hydraulic parameters on the computed serviceability of infrastructure slopes
Aikaterini Tsiampousi, Lidija Zdravkovic and David M Potts

01029 Field monitoring of soil-moisture to understand the hydrological response of a road-cut slope
Samprada Pradhan, David G. Toll, Nick J. Rosser and Matthew J. Brain

01003 Probabilistic analysis of flood embankment stability: the case study of the Adige River embankment in Italy
Alessia Amabile, Fabio De Polo and Alessandro Tarantino

01022 Effect of Extreme Rainfall Intensity On Matric Suction and Ground Movement
Mastura Azmi, Muhammad Hazwan Zaki, Muhd Harris Ramli and Siti Aimi Nadia Mohd Yusoff

01010 Behavior of unsaturated pelitic soil in a railway context
Bilal Yoka Khail, Pierre Breul and Mathilde Morvan

01015 Stability Analysis of Unsupported Vertical Cuts in the Vadose Zone using 2D and 3D Numerical Methods
Gregory Brennan, Won Taek Oh and Othman Nasir

01017 Field and laboratory investigation of rainfall-triggered slope failure in unsaturated loess soils, New Zealand
Katherine Yates, Adrian Russell and Clark Fenton
S11

Chair: Anthony Leung

02011 A water retention curve model for compacted clays subjected to salinization and desalinization processes
  Gabriele Della Vecchia, Giulia Scelsi and Guido Musso

02014 A deformation-dependent soil-water characteristic surface model considering hysteresis
  Guoqing Cai, Tianchi Wu, Hao Li, Chenggang Zhao, Jingjing Tian and Jian Li

03005 The influence of rates of drying and wetting on measurements of soil water retention curves
  Arash Azizi, Ashutosh Kumar and David Geoffrey Toll

02029 Modelling evaporation processes of cement-bentonite mixtures
  Vincenzo Sergio Vespo, Gabriele Della Vecchia and Guido Musso

03003 Effect of stress state on the water retention curve of pyroclastic soil
  Ana Sofia Dias, Abhijith Kamath, Marianna Pirone and Gianfranco Urci

02015 Theoretical modeling of retention curve
  Jacques Monnet, Boutonnier Luc, Saïd Taïbi, Dino Mahmutovic and Denis Branque

01011 Shear strength and retention models of a partially saturated riverbank silty soil
  Carmine Gerardo Gragnano, Mariagiovanna Moscariello, Sabatino Cuomo and Guido Gottardi

03011 Water retention and transfer properties of a Green roof volcanic substrate
  Filip Stanic, Pierre Delage and Yu Jun Cui
S12
Chair: Alessio Ferrari

03014 Measurement of xylem water pressure using High-Capacity Tensiometer and benchmarking against Pressure Chamber and Thermocouple Psychrometer
Giuseppe Tedeschi, Roberta Dainese and Alessandro Tarantino

03020 Developing a high capacity axis translation apparatus for gas shale testing
Jinwoo Kim, Alessio Ferrari, Russell Ewy and Lyesse Laloui

03022 Determination of permeability and shear strength properties of unsaturated residual soil from flysch rock mass
Josip Peranić, Mariagiovanna Moscariello, Sabatino Cuomo and Željko Arbanas

03026 Retention behaviour of compacted and reconstituted scaly clays
Marco Rosone and Alessio Ferrari

01020 Subsidence in cultivated peatlands, is it due to shrinkage, consolidation or oxidation?
Leon van Paassen, Nor Hazwani Md Zain and Cristina Jommi

01012 Calibration of a simple 1D model for the hydraulic response of regional dykes in The Netherlands
Ching-Yu Chao, Maarten Bakker and Cristina Jommi

LUNCH BREAK

PLENARY SESSION

KEYNOTE 2
Chair: Pierre Delage

A sustainable and bioengineered three-layer unsaturated landfill cover system without a geomembrane.
Charles Ng
HKUST Hong Kong, China

BREAK
PARALLEL SESSIONS 20/10/2020  Afternoon 14h45 - 15h45
S13
Chair: Francesca Casini

01002 The TERRE project: Towards low-carbon geotechnical engineering by exploiting suction as natural untapped soil reinforcement
Alessandro Tarantino, Grainne El Mountassir, Simon Wheeler, Domenico Gallipoli, Giacomo Russo, Charles Augarde, Gianfranco Urciuoli, Marianna Pirone, Alexia Stokes, Jan Willem van de Kuilen, Wolfgang Gard, Thierry Fourcaud, Enrique Romero, Angel Priegue, Colin C Smith, Pyrène Larrey-Lassalle, Patrick Becker and Alessio Ferrari

03001 Tensile strength of a vegetated and partially saturated soil
Alessandro Fraccica, Enrique Romero, Thierry Fourcaud, Mercedes Sondon and Luis Gandarillas

01032 Infiltration behaviour of dike covers made of dredged material on the Rostock Research dike
Tim Jurisch, Stefan Cantre and Fokke Saathoff

01013 Development of a Thornthwaite Moisture Index Map for Trinidad and Tobago
Damian Alexander, Derek Gay and Kyung Park

S14
Chair: Núria Pinyol

03023 Failure mode transitions of unconfined granular media from dry, to unsaturated, to “quasi-fully” saturated states
Katherine Winters, Woodman Berry, Greg Siemens and Oliver-Denzil Taylor

02008 A micromechanical analysis of a drying sand castle using DEM
Carlos Pereira, João Ribas Maranha and Rafaela Cardoso

03033 An experimental study of the behaviour of two rockfills accounting for the effects of degree of saturation
Roberta Ventini, Alessandro Flora, Stefania Lirer, Claudio Mancuso and Antonio Cammarota

02018 Development of an unfrozen water retention curve for capturing soil density and specific surface effects
Jiwen Zhang, Qingyi Mu, Hongjian Liao and Jie Cao
S15
Chair: Gabriele Della Vecchia

03019 Preliminary study on the contribution of osmotic effects for the electrical resistivity of sands
   Inês Borges, Vikas Gingine and Rafaela Cardoso

03015 Monitoring drying and wetting of a cement bentonite mixture with Electrical Resistivity Tomography
   Guido Musso, Antonio Zibisco, Renato Maria Cosentini, Paolo Trischitta and Gabriele Della Vecchia

03016 Electric Conductivity Probes to Study Change in Degree of Saturation - Bench Top Laboratory Tests
   Hadi Kazemiroodsari, Mishac K Yegian, Akram Alshawabkeh and Seda Gokyer

03012 A new approach of accounting for impedance effects in Gardner’s method of determining the hydraulic conductivity of unsaturated soils
   Filip Stanic, Pierre Delage and Yu Jun Cui

BREAK

PARALLEL SESSIONS

S16
Chair: Alessandro Tarantino

01021 Physical modelling of piles under lateral loading in unsaturated soils
   Leonardo Maria Lalicata, Giada Rotisciani, Augusto Desideri, Francesca Casini and Luc Thorel

01009 Analysis of massive sulphate attack to cement-treated compacted soils
   Anna Ramon Tarragona and Eduardo Alonso

04005 Impacts of Unsaturated Conditions on The Ultimate Axial Capacity of Energy Piles
   Fatemah Behbehani and John S. McCartney

00002 Unsaturated Soils in practice - Closure of the FUNDEC course prepared for the Portuguese technical community
   Rafaela Cardoso
S17
Chair: Claudio Tamagnini

02022 Application of single-board computers in experimental research on unsaturated soils
Marius Milatz

03006 Expansive Clay Cracking Behavior through Digital Image Correlation
Arthur Gomes Dantas De Araújo, Nayara Torres Belfort, Felipe Araújo Silva Barbosa,
Thalita Cristina Rodrigues Silva, Silvio Romero De Melo Ferreira and Leonardo José
Do Nascimento Guimarães

03017 Capillary Rise Determination Using Simplified Image Analysis Method
Harris Ramli, Lee Zheng Xian, Mastura Azmi and Fauziah Ahmad

03010 Image-based measurements of degree of saturation
Ferran Parera, Núria M. Pinyol and Eduardo E. Alonso

03021 Experimental and numerical analysis of soil desiccating cracks in compacted and
non-compacted specimens
Josbel Cordero, Abdallah Najdi, David Encalada, Pere C. Prat and Alberto Ledesma

S18
Chair: Anne-Catherine Dieudonne

03034 Characterization of Sand and Zeolite Stabilized Expansive Soil as Landfill Liner
Material under Environmental and Climatic Effects
Şerife Öncü and Huriye Bilsel

03035 Effect of external hydraulic head on swelling of unsaturated clay
Shay Nachum, Mark Talesnick and Sam Frydman

03036 Frost heave and thaw settlement of initially saturated-slurried and compacted-
saturated materials
Snehasis Tripathy, Osama Mahdi Al-Hussaini, Peter John Cleall, Stephen William
Rees and Han-Lin Wang

03038 Yielding of partially saturated soils from saturated to dry state
Vincenzo Butticè, Alessio Ferrari and Marco Rosone
Wednesday 21st October

**PLENARY SESSION** 21/10/2020 Morning 9h00 - 10h30

**INVITED LECTURES: SESSION EFFECTIVE STRESSES**

**Chair:** Daichao Sheng

- Effective stress in unsaturated soils: a microstructure perspective  
  **Jean-Michel Pereira,** ENPC Paris, France

- Effective stress in unsaturated soils: lessons from capillarity in regular sphere arrangements  
  **João Ribas Maranha,** LNEC, Lisbon, Portugal

- Effective stress and microstructure in unsaturated soils  
  **Jean Vaunat,** UPC Barcelona, Spain

**BREAK**

**PARALLEL SESSIONS** 21/10/2020 Morning 10h45 - 12h15

**S19**

**Chair:** Yun-Ju Cui

- 02025 Numerical investigation on water exchange of shale samples  
  **Sara Incollingo,** Alessio Ferrari and Guido Musso

- 02028 Evaluation of direct shear strength of compacted bentonite having pore-water pressure  
  **Tomoyoshi Nishimura** and **Masaaki Fukaya**

- 03013 A physical model for the interaction between unsaturated soils and retaining structures  
  **Gianluca Speranza,** Alessio Ferrari and Lyesse Laloui

- 03030 Laboratory testing of seepage in concrete  
  **Miklós Pap,** András Mahler and Salem Georges Nehme

- 03031 Analysis of the suction evolution during direct shear test in a silty sand soil  
  **Omar Al-Emami,** Gabriela Medero, Fernando Marinho and Melis Sutman

- 03032 Preliminary investigation on the water retention behaviour of cement bentonite mixtures  
  **Paolo Trischitta,** Renato Maria Cosentini, Gabriele Della Vecchia and Guido Musso

- 03029 Modeling Unsaturated Soil Response Beyond Residual Suction State via Vapor-Pressure Controlled Triaxial Testing  
  **Mathilde Morvan,** Ujwalkumar Patil, Laureano Hoyos, Anand Puppala and Surya S.C. Congress
S20

Chair: Katerina Tsiampousi

02007 Bounding surface constitutive model for unsaturated soils considering microscopic pore structure and bonding effect
Bowen Han, Guoqing Cai, Jian Li, Chenggang Zhao and Hao Li

02009 Modeling multiphase flow with a hybrid model based on Pore-network and lattice Boltzmann method
Eduard Puig Montellà, Chao Yuan, Bruno Chareyre and Antonio Gens

02012 Numerical modelling of the response of an unsaturated silty soil under wetting and gravitational loading processes
Giada Maria Rotisciani, Leonardo Lalicata, Augusto Desideri and Francesca Casini

02013 Overview and conceptual constitutive framework for pellet-based buffer materials
Giulia Marianna Ghiadistri, Lidija Zdravković, David M. Potts and Aikaterini Tsiampousi

02001 A single-stress model for the prediction of yielding of unsaturated cemented soils under isotropic loads
Agostino Walter Bruno, Domenico Gallipoli, Mohamed Rouainia and Marti Lloret-Cabot

02004 An extended generalized effective stress for active clays
Angelica Tuttolomondo, Alessio Ferrari and Lyesse Laloui

02016 A plastic volumetric strain dependent soil water retention curve
Jayantha Kodikara and Chathurika Jayasundara

01006 Numerical study on bearing capacity of a pile group next to a slope in unsaturated soils
Amirreza Pourfatollah, Ali Pirjalili and Aliakbar Golshani
21/10/2020  Morning 10h45 - 12h15

S21  
Chair: Sérgio Lourenço

01008 Monitoring of thermo-hydrological behaviour in Green Infrastructure  
Anil Yildiz, Ross Stirling and Stephanie Glendinning

04010 Low-suction water retention capacity of bentonite at high temperature  
María Victoria Villar, Carlos Gutiérrez-Álvarez and Rubén Iglesias

04012 Restoring initial conditions in a deep argillaceous rock with induced suction on retrieval  
Nuria Sau Valenzuela, Enrique Romero Morales and Hervé Van Baelen

04013 Effect of initial conditions on the predicted response of thermally-activated piles  
Peter John Bourne-Webb, Teresa Maria Bodas Freitas, Donatella Sterpi and Martina Zito

04014 Effect of Elevated Temperatures on Lateral Earth Pressures in Unsaturated Soils  
Sannith Kumar Thota and Farshid Vahedifard

04007 Effects of temperature, test time duration and heat flux in thermal conductivity measurements under transient conditions in dry and fully saturated states  
Kamar Aljundi, Ana Vieira, José Lapa and Rafaela Cardoso

04015 Numerically reproduced HE-E experiment of Mt Terri project by Thermo-Hydro-Mechanical coupled model  
Shin Sato, Shuichi Yamamoto, Masaaki Fukaya, Yasuhiro Tawara, Kei Tanaka, Florian Kober and Seda Torisu

01034 Experimental and Numerical Investigation of the Drying of an Agricultural Soil  
Njaka Ralaizafisoloarivony, Kien Duc Tran, Aurore Degré, Benoit Mercatoris, Angélique Léonard, Dominique Toye and Robert Charlier

LUNCH BREAK

PLENARY SESSION  
21/10/2020  Afternoon 13h30 - 14h30

YOUNG INVITED LECTURES  
Chair: Eduardo Alonso

Granular Material Point Method or how to model rapid flows of unsaturated granular materials  
Wojciech Solowski, AALTO  Finland

Unsaturated soils and large deformations with the Material Point Method.  
Alba Yerro, Virginia Tech, USA
BREAK

PARALLEL SESSIONS 21/10/2020  Afternoon 14h45 - 15h30

S22-1
Chair: Michael Bardanis

01014 Stabilization of soil erosion using vetiver (Chrysopogon zizanioides L.) in slopes: a field case study of selected grounds at Guatemala
Eduardo Garzón Garzón, Flor M. González-Miranda, Juan Reca and Pedro José Sánchez-Soto

03025 Wetting-induced collapse behaviour of a natural and vegetated coarse pyroclastic soil
Leonardo Cascini, Vittoria Capobianco, Sabatino Cuomo and Vito Foresta

01007 Volume change behaviour of root-permeated soils under partially saturated conditions
Anil Yildiz, Frank Graf and Sarah M. Springman

S23 - 1 - Special session on biocementation
Chair: Annette Esnault-Filet

05001 BOREAL, Bio-reinforcement of embankments by biocalcification
Annette Esnault Filet, Ira Gutjahr, Aurelie Garandet, Amandine Viglino, Rémi Béguin, Jean-Michel Monier, Laurent Oxarango, Fabrice Emeriault and Sabine Castanier Perthuisot

05004 Comparison of experimental techniques for biocementation of sands considering homogeneous volume distribution of precipitated calcium carbonate
Francisco Centeno Dias, Inês Borges, Sofia O.D. Duarte, Gabriel A. Monteiro and Rafaela Cardoso

05003 Unsaturated Fluid Flow through Granular Soils Treated with Microbial Induced Desaturation and Precipitation
Elizabeth Stallings Young, Leon van Paassen and Claudia Zapata

05002 Physical and geotechnical properties of a silty sand soil treated with calcium carbonate fixing bacteria
Eduardo Garzón Garzón, Laura Morales, Juan Reca, Enrique Romero and Pedro José Sánchez-Soto
S24-1
Chair: Marti Lloret-Cabot

02020 Calibration of a generalized plasticity model for compacted silty sand under constant-suction shearing tests
Marcos García-García, Ujwalkumar Patil, Diego Manzanal, Laureano Hoyos, Anand Puppala and Manuel Pastor

02019 The mechanical behavior of an expansive soil due to long-term seasonal rainfalls
Kai Li, Liang Kong, Hossein Nowamooz and Cyrille Chazallon

02021 Modelling of simple shear tests on volcanic unsaturated sands
Mariagiovanna Moscariello, Yanni Chen, Sabatino Cuomo and Giuseppe Buscarnera

02023 Swelling Curve in Terms of Effective Stress for Expansive Clays
Rafael Baltodano-Goulding

SHORT BREAK

PARALLEL SESSIONS

S22 - 2
Chair: Guido Musso

03024 Unsaturated Shear Strength Parameters of Compacted Clayey Soil via Suction-controlled Ring Shear Testing
Laureano R. Hoyos, Jairo E. Yepes and Anand J. Puppala

04011 Swelling behavior of unsaturated claystone/ bentonite mixtures
Marvin Middelhoff, Olivier Cuisinier, Farimah Masrouri, Jean Talandier and Nathalie Conil

03008 Changes on diametral compression behaviour of compacted marls due to drying
Carmen Covadonga García-Fernandez, Rafaela Cardoso, Martina Inmaculda Alvarez-Fernandez and Celestino Gonzalez-Nicieza
S23 - 2 - Special session on biocementation

Chair: Annette Esnault-Filet

05005 Discrete Element Modelling for biocemented sand: effect of calcite distribution at the microscopic scale
Mohammad Abbas, Deepak Kunhappan, Abdelali Dadda, Christian Geindreau, Fabrice Emeriault, Annette Esnault-Filet and Aurélie Garandet

05006 Implementation of biocementation for a partially saturated problematic soil of the UK railway network
Muhammad Umair Safdar, Maria Mavroulidou, Michael Gunn, Christopher Gray, Diane Purchase, Jonathan Garelick and Ian Payne

05008 Effect of the soil type on the biocementation process by enzymatic way
Paulo Venda Oliveira and Luis Freitas

05009 The effect of microbial calcite precipitation on the retention properties of unsaturated fine-grained soils: discussion of the governing factors
Rahim Saffari, Ehsan Nikooee and Ghassem Habibagahi

S24-2 - Special session

Chair: Xueyu Geng

3041 Fall cone test on biopolymer-treated clay
Zhanbo Cheng, Jing Ni, Haotian Ding and Xueyu Geng

3043 Investigating the contribution of claystone to the swelling pressure of its mixture with bentonite
Zhixiong Zeng, Yu-Jun Cui, Nathalie Conil and Jean Talandier

3044 Changes in microstructure and mineralogy of a lime-treated silty soil during curing time
Zi Ying, Yu-Jun Cui, Nadia Benahmed and Myriam Duc

1031 Monitoring of earthen long linear embankments by geophysical tools integrated with geotechnical probes
Stefano Utili

SHORT BREAK

PLENARY SESSION

21/10/2020 Afternoon 16h30 - 17h00

CLOSURE
### Table 1 - Number from the table of contents vs numbers from easychair system (141 papers in total)

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