

JOAQUÍN LIAUDAT

Institute of Geotechnics
Technical University of Darmstadt (TU Darmstadt)
Franziska-Braun-Str. 7 (L5—01 430), 64287 Darmstadt, DE
joaquin.Liaudat@tu-darmstadt.de
Linkedin — Google Scholar — ORCID — Scopus — ResearchGate

EDUCATION

Universitat Politècnica de Catalunya (UPC), Spain

Doctorate in Geotechnical Engineering 10.2010 – 06.2018
Thesis: Experimental and numerical study of the effect of stress on ASR expansions in concrete
Awarded *Cum Laude*

Universidad Nacional de La Plata (UNLP), Argentina

Diploma in Civil Engineering (equivalent to BSc+MSc) 03.2002 – 03.2009
Class rank: 1st
Final Project: Underground train line for the city of La Plata
Awarded with honours

Escuela de Educación Técnica, Ayacucho, Argentina

Technician in Electro-Mechanics 03.1996 – 12.2001
Vocational Education and Training
Class rank: 1st

PROFESSIONAL EXPERIENCE

Institute of Geotechnics, TU Darmstadt, Germany

Research Associate 01.2024 – present

Department of Geoscience and Engineering, TU Delft, The Netherlands

Guest Researcher 01.2024 – 12.2024
Postdoc Researcher (Marie Skłodowska-Curie Fellow) 03.2022 – 12.2023
Postdoc Researcher 04.2020 – 02.2022

Dept. of Civil and Environmental Engineering, UPC, Spain

Postdoc Research Assistant 07.2018 – 03.2020
Graduate Research Assistant 10.2012 – 06.2018
Graduate Research Fellow 10.2010 – 09.2012

HERSO S.A., Railway Building Company, Argentina

Civil Engineer in Technical Office 04.2009 – 09.2010

QUASDAM Ingeniería S.A., Consulting Firm, Argentina

Undergraduate Intern 02.2008 – 04.2008

Dept. of Construction Engineering, UNLP, Argentina

Undergraduate Research Assistant (part-time) 02.2007 – 12.2008

Dept. of Construction Engineering, UNLP, Argentina

Teaching Assistant 10.2007 – 05.2009

- Explained and supervised practical assignments for undergraduate students in the areas of Materials Science and Structural Engineering.
- Student representative in the Civil Engineering Programme Committee.

SCHOLARSHIPS and AWARDS

- **Competitive Post-doctoral Fellowship**, Marie Skłodowska-Curie Actions, European Commission. Grant. No. 101028292. March 2022 – Dec. 2023.
- **Competitive Pre-doctoral Research Grant FPI (BES-2010-030515)**, Ministry of Science and Innovation, Spain, Oct. 2010 – Sept. 2014.
- **‘Dr. Joaquín V. González’ Award**. Prize awarded each year to the best students of the UNLP. Dec. 2009.
- **Competitive Undergraduate Research Grant**, UNLP, Argentina, Feb. – Dec. 2008.
- **Competitive Undergraduate Research Grant**, UNLP, Argentina, Feb. – Dec. 2007.

RESEARCH PROJECTS

- ‘Experimental and numerical study of the mechanical behavior of saline rock, including the interaction between creep and fracture’, (PI: I. Carol and C.M. López), funded by the Ministry of Education and Science, Government of Spain, grant No. PID2023-149724NB-I00. Sep. 2024 – Aug 2027
- ‘GEOLAB: Science for enhancing Europe’s Critical Infrastructure’, funded by the European Union H2020 Research and Innovation Programme under grant agreement 101006512. Feb. 2021 – July 2025
- ‘GASCLAY: Formation and Vanishing of Discrete Gas Flow Pathways in Clays’ (PI: J. Liaudat), funded by the European Union’s Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No. 101028292. March 2022 – Feb. 2024.
- ‘New developments in the experimental and numerical study of the well cement degradation by acid attack, in CO₂ storage places’ (PI: I. Carol and C.M. López), funded by the Ministry of Science and Innovation, Government of Spain, grant No. PID2020-117933RB-I00. Sep. 2021 – Aug. 2025.
- ‘EURAD: European Joint Programme on Radioactive Waste Management, WP GAS: Mechanistic understanding of gas transport in clay materials’, funded by the European Union’s Horizon 2020 research and innovation programme under grant agreement No. 847593. 2019–2024.
- ‘Bio-inspired “bubble gum” to prevent cracks in soils’ (PI: S. Muraro), funded by the Dutch Research Council (NWO), grant No. OCENW.XS4.238 . June 2021 – May 2022.
- ‘Development of a 3D geomechanical model for unconventional assets’ (PI: I. Carol). A series of research contacts funded by REPSOL S.A., grant No. C08608. 2012 – 2020.
- ‘Cement degradation by acid attack in CO₂ storage, experimental study and numerical simulation’ (PI: I. Carol and C.M. López), funded by the Ministry of Education and Science, Government of Spain, grant No. BIA2016-76543-R. Dec. 2016 – Dec. 2020.
- ‘Mechanics of the expansive processes of cement and concrete at the micrometric scale and applications’ (PI: I. Carol), funded by the Ministry of Economy and Competitiveness (MINECO), Government of Spain, grant No. BIA2012-36898. Jan. 2013 – Dec. 2015.
- ‘New development and applications of coupled THMC multiscale analysis to deterioration problems in concrete’ (PI: I. Carol), funded by the Ministry of Science and Innovation (MICINN), Government of Spain, grant No. BIA2009-10491. Jan. 2010 – Dec. 2012.

PUBLICATIONS

Reviewed Journals

11. Z. Huang, R. Hoedemaker, J. Liaudat, B. V. D. Eijnden, P. J. Vardon, M. A. Hicks, A.-C. Dieudonné, and D. Dieudonné. Influence of heterogeneity on gas transport in natural clays: a stochastic analysis. *Environmental Geotechnics*, 2026

10. A. Escanellas, E. Cámara, J. Liaudat, and I. Carol. Experimental study of the time-dependent behaviour of fracture propagation in salt rock. *Geomechanics for Energy and the Environment*, 43:100687, 9 2025
9. W. Luo, J. Liaudat, J. Ouf, A. C. Dieudonné, F. Amann, and P. J. Vardon. Numerical modelling of fracturing processes during cold water injection into geothermal reservoirs: Verification and qualitative validation. *Computers and Geotechnics*, 183, 7 2025
8. J. Liaudat and S. Muraro. Drying of silty soil treated with superabsorbent hydrogels: Retention behaviour and cracking. *Engineering Geology*, page 107433, 2 2024
7. J. Liaudat, A.-C. Dieudonné, and P. J. Vardon. Modelling gas fracturing in saturated clay samples using triple-node zero-thickness interface elements. *Computers and Geotechnics*, 154:105128, 2023
6. A. Martínez, J. Liaudat, C. M. López, and I. Carol. 3d zero-thickness interface model for fracture of cement-based materials with chemical degradation. *International Journal of Solids and Structures*, 238:111379, 2022
5. J. Liaudat, C. M. López, and I. Carol. Experimental study of the effects of mechanical restraints on asr expansions in concrete. *Revista Portuguesa de Engenharia de Estruturas*, III:15–24, 2021
4. J. Liaudat, I. Carol, and C. M. López. Model for alkali-silica reaction expansions in concrete using zero-thickness chemo-mechanical interface elements. *International Journal of Solids and Structures*, 207:145–177, 2020
3. J. Liaudat, I. Carol, C. M. López, and A. Leemann. Asr expansions at the level of a single glass-cement paste interface: experimental results and proposal of a reaction-expansion mechanism. *Construction and Building Materials*, 218:108–118, 2019
2. J. Liaudat, I. Carol, C. M. López, and V. E. Saouma. Asr expansions in concrete under triaxial confinement. *Cement and Concrete Composites*, 86:160–170, 2018
1. J. Liaudat, A. Martínez, C. M. López, and I. Carol. Modelling acid attack of oilwell cement exposed to carbonated brine. *International Journal of Greenhouse Gas Control*, 68C:191–202, 2018

Refereed Conference Proceedings

26. Z. Huang, B. van den Eijnden, J. Liaudat, P. Vardon, M. A. Hicks, and A.-C. Dieudonné. Modelling the effects of heterogeneity on two-phase flow in clays. In *3rd International Conference on Energy Geotechnics (ICEGT-2025)*, 2025
25. J. Macháček, J. Liaudat, S. Siegel, and H. Zachert. Blind prediction contest: Piles under monotonic and cyclic lateral loading. In *Proceedings of the 5th International Symposium on Frontiers in Offshore Geotechnics (ISFOG 2025)*, 2025
24. R. Chalhoub, C. N. Abadie, M. K. A. Katabi, F. Szymkiewicz, C. Minatchy, C. Dano, A. Kochnev, J. Liaudat, H. Zachert, and O. Jenck. Measurement of soil response to laterally loaded piles using distributed fibre optic sensing. In *Proceedings of the 5th International Symposium on Frontiers in Offshore Geotechnics (ISFOG 2025)*, 2025
23. R. Chalhoub, O. Jenck, A. Kochnev, J. Liaudat, C. Dano, C. N. Abadie, F. Szymkiewicz, M. K. A. Katabi, and H. Zachert. Floating wind turbine anchor piles under lateral multidirectional cyclic loading: experimental investigation. In *Proceedings of the 5th International Symposium on Frontiers in Offshore Geotechnics (ISFOG 2025)*. ISSMGE, 2025
22. A. Kochnev, R. Chalhoub, J. Liaudat, O. Jenck, C. Dano, C. Abadie, F. Szymkiewicz, M. K. A. Katabi, and H. Zachert. Großmaßstäbliche versuche an ankerpfählen für schwimmende windenergieanlagen unter lateraler, zyklischer, multidirektionaler belastung (large-scale tests on anchor piles for floating wind turbines under lateral, cyclic, multidirectional loading). In *Proceedings of Pfahl-Symposium 2025*, pages 361–383. Technische Universität Braunschweig, Institut für Geomechanik und Geotechnik, 2025
21. H. Zachert, J. Liaudat, and J. Macháček. Prognosewettbewerb zu pfählen unter lateraler monotoner und zyklischer belastung in sand (prediction contest for piles under lateral monotonic and cyclic loading in sand). In *Proceedings of Pfahl-Symposium 2025*, pages 403–415. Technische Universität Braunschweig, Institut für Geomechanik und Geotechnik, 2025

20. J. Liaudat, P. J. Vardon, M. A. Hicks, and A. C. Dieudonné. New experimental device for the visualisation of fluid-driven cracks in clays. In *Proceedings of the 5th International Symposium on Geomechanics from Micro to Macro*. ISSMGE, 2024
19. J. Liaudat, A. Kochnev, H. Zachert, W. Ovalle-Villamil, S. Muraro, M. A. Cabrera, M. Blanc, L. Thorel, A. Marin, L. Jones, I. Anastasopoulos, S. Stanier, G. Viggiani, S. Haigh, S. Liu, S. P. G. Madabhushi, S. J. M. V. Eekelen, K. Castelein, D. D. Lange, C. Cengiz, O. Jenck, C. Dano, and R. Chalhoub. Assessing repeatability, scale effects, and consistency in geotechnical physical modelling: a collaborative benchmark exercise on horizontally loaded piles in dry sand. In *Proceedings of the 5th European Conference on Physical Modelling in Geotechnics (ECPMG2024)*. ISSMGE, 2024
18. A. Escanellas, E. Cámara, J. Liaudat, and I. Carol. *Rate-dependent behaviour of fracture propagation in salt rock*, pages 180–189. CRC Press, 2022
17. A. Martínez, J. Liaudat, C. M. López, and I. Carol. *Effect of long-term pore pressure evolution on the integrity of cement plugs of abandoned oil wells in CCS sites*. International Center for Numerical Methods in Engineering (CIMNE), 2021
16. L. Barandiarán, J. Liaudat, C. M. López, and I. Carol. *Numerical modelling of two-phase flow in fractured rock masses using zero-thickness interface elements*. International Center for Numerical Methods in Engineering (CIMNE), 2021
15. L. Barandiarán, J. Liaudat, C. M. López, and I. Carol. *Modelling acid attack of oilwell cement exposed to carbonated brine: effect of specimen geometry on experimental results*, pages 435–446. International Center for Numerical Methods in Engineering (CIMNE), 2019
14. A. Martínez, J. Liaudat, C. M. López, and I. Carol. *Zero-thickness interface model with chemical degradation by acid attack*, pages 456–466. International Center for Numerical Methods in Engineering (CIMNE), 2019
13. J. Liaudat, C. M. López, and I. Carol. *Coupled C-M meso-scale model for ASR expansion in concrete*, pages 363–370. Taylor and Francis Group, 2018
12. J. Liaudat, D. Garolera, I. Carol, M. R. Lakshmikantha, and J. Alvarellos. *Avoiding fracture instability in Wedge Splitting Tests by means of numerical simulations*, pages 514–521. International Center for Numerical Methods in Engineering (CIMNE), 2017
11. A. Martínez, J. Liaudat, C. M. López, and I. Carol. *Diffusion-reaction modelling of the degradation of oil-well cement exposed to carbonated brine*, pages 625–635. International Center for Numerical Methods in Engineering (CIMNE), 2017
10. I. Carol, J. Liaudat, and C. M. López. *Modeling Concrete Expansions via Coupled C-M Mesoscale Analysis with Zero-Thickness Interface Elements, and Lab Experiments*, pages 248–260. Wiley-ISTE, 2017
9. J. Liaudat, C. M. López, and I. Carol. *Numerical and experimental study of ASR in concrete at the meso-level*. International Association of Fracture Mechanics for Concrete and Concrete Structures, 2016
8. J. Liaudat, C. M. López, and I. Carol. *Free expansion tests for ASR at the level of a single aggregate-matrix interface: experimental results and numerical modelling*, pages 189–195. Springer, Cham, 2015
7. J. Liaudat, A. Martínez, C. M. López, and I. Carol. *Numerical Modelling of ASR Expansions in Concrete*, pages 445–454. American Society of Civil Engineers, 2015
6. J. Liaudat, D. Garolera, A. Martínez, I. Carol, M. R. Lakshmikantha, and J. Alvarellos. *Numerical modelling of the Wedge Splitting Test in rock specimens, using fracture-based zero-thickness interface elements*, pages 974–981. International Center for Numerical Methods in Engineering (CIMNE), first edition, 2015
5. J. Liaudat, C. M. López, and I. Carol. *Diffusion-reaction model for ASR: formulation and 1D numerical implementation*, pages 639–648. CRC Press, 2014
4. J. Liaudat, C. M. López, and I. Carol. *Diffusion-reaction model for Alkali-Silica Reaction in concrete*, pages 479–489. International Center for Numerical Methods in Engineering (CIMNE), 2013
3. J. Liaudat, M. Rodríguez, C. M. López, and I. Carol. *Recent developments in durability mesomechanics of concrete, including cracking via interface elements*, pages 174–181. American Society of Civil Engineers, 2013

2. J. Liaudat, D. Garolera, C. M. López, and I. Carol. *Numerical modeling of micro-indentation tests in Portland cement paste, using finite elements with fracture-based zero-thickness interfaces*, pages 910–917. RILEM Publications, 2012
1. J. F. Bissio and J. Liaudat. Análisis simplificado de la respuesta dinámica no lineal de presas de enrocado. In *21^º Jornadas Argentinas de Ingeniería Estructural*. Asociación de Ingenieros Estructurales de Argentina, 2010

Other Contributions to International Conferences

17. J. Liaudat, C. M. López, and I. Carol. Multi-scale investigation and modeling of alkali-silica reaction in concrete under confinement (extended abstract). In A. Ramon and E. Alonso, editors, *Proceedings of the IX International Workshop on Crystallization in Porous Media (CRYSPOM25)*, 2025
16. J. Liaudat, P. J. Vardon, M. A. Hicks, and A. C. Dieudonné. New experimental device for the visualisation of fluid-driven cracks in clays (poster). In *5th International Symposium on Geomechanics from Micro to Macro*, 2024
15. M. Schneider, A. Kochnev, J. Liaudat, and H. Zachert. Großmaßstäbliche modellversuche am institut für geotechnik: Piled embankments und pfähle unter zyklischer, lateraler last (poster). In *38. Baugrundtagung mit Fachausstellung Geotechnik, 25–27 September 2024, Bremen*, volume 38, 2024
14. W. Luo, O. Josselin, P. J. Vardon, A. catherine Dieudonné, J. Liaudat, K. Khaledi, and R. Jalali. Comparison of two approaches for modelling fracture opening due to cold water injection in geothermal reservoir. In *Symposium on Energy Geotechnics — Accelerating the energy transition, 3-5 October 2023, Delft, the Netherlands*, pages 3–5. TU Delft OPEN, 2023
13. L. Barandiarán, J. Liaudat, C. M. López, D. Garolera, and I. Carol. New results in numerical modelling of two-phase flow in fractured rock masses using zero-thickness interface elements. In *XVII International Conference on Computational Plasticity - Fundamentals and Applications (COMPLAS XVII)*. CIMNE, 2023
12. J. Liaudat, A. C. Dieudonné, and P. J. Vardon. Modelling gas fracturing experiments in saturated clay using zero-thickness interface elements. In *Symposium on Energy Geotechnics — Accelerating the energy transition, 3-5 October 2023, Delft, the Netherlands*. TU Delft OPEN, 2023
11. A. Escanellas, J. Liaudat, and I. Carol. On modelling the loading rate dependency of salt rock fracturing. In *XVII International Conference on Computational Plasticity, COMPLAS 2023*. CIMNE, 2023
10. S. Muraro, J. Liaudat, and C. Jommi. *Shrinkage and retention behaviour of a clayey soil treated with superabsorbent hydrogels (Abstract)*, volume 14, page 198. Scientific Research Abstracts, 2023
9. J. B. M. Zoutendijk, J. Liaudat, and A.-C. Dieudonné. A program to insert interface elements in existing meshes (abstract). In *Third International Workshop on the Finite Element Code LAGAMINE (LAGASHOP 2022), 5-7 July 2022 — Université Grenoble Alpes*, pages 1–2, 2022
8. Z. Huang, J. Liaudat, P. J. Vardon, M. A. Hicks, and A.-C. Dieudonné. Modelling of preferential gas pathways in heterogeneous and saturated clay (abstract). In *Third International Workshop on the Finite Element Code LAGAMINE (LAGASHOP 2022), 5-7 July 2022 — Université Grenoble Alpes*, 2022
7. J. Liaudat, A.-C. Dieudonné, and P. J. Vardon. Pneumo-hydro-mechanical triple-node zero-thickness cohesive interface element (abstract). In *Third International Workshop on the Finite Element Code LAGAMINE (LAGASHOP 2022), 5-7 July 2022 — Université Grenoble Alpes*, 2022
6. J. Liaudat, A.-C. Dieudonné, and P. J. Vardon. Numerical modelling of discrete gas flow pathways in water saturated clay (abstract). In *8th International conference on clays in natural and engineered barriers for radioactive waste confinement, Nancy, France, 13-16 June, 2022*, 2022
5. Z. Huang, J. Liaudat, P. J. Vardon, and A.-C. Dieudonné. Modelling gas flow along localized dilatant pathways: challenges and perspective (poster). In *8th International Conference on Clays in Natural and Engineered Barriers for Radioactive Waste Confinement, 13-16 June, 2022*, 2022

4. J. Liaudat, A. Catherine Dieudonné, and P. J. Vardon. Numerical modelling of discrete gas flow pathways in water saturated clay. In *E3S Web of Conferences — 2nd International Conference on Energy Geotechnics (ICEGT 2020) — April 10-13, 2022*, volume 205, page 13008, 2022
3. A. Escanellas, E. Cámara, J. Liaudat, and I. Carol. Experimental and numerical study of the time dependent behavior of fracture propagation in salt rock. In *The Biot-Bazant Conference*. Figshare, 2021
2. J. Liaudat, D. Garolera, A. Martínez, I. Carol, M. R. Lakshminantha, and J. Alvarelos. *Analysis of Crack Propagation Instabilities in Rock Specimens via Numerical Analysis of Wedge Splitting Tests (Abstract)*, page 265. CCSd (Centre pour la Communication Scientifique Directe), 2015
1. J. Liaudat and I. Carol. Durability mechanics of cement-based materials via multiscale fem with discrete cracking: application to asr and other expansive processes at the micro-scale (poster). In *NANOCEM Consortium Spring meeting, April 23 - 25, 2013*, 2013

Supervised Dissertations

Doctoral Theses

1. A. Martínez. Estudio numérico del ataque ácido por co₂ en cementos de pozos de petróleo sellados (numerical study of acid attack by co₂ on oilwell cements). 2020

Master Theses

6. C. C. Wiening. Großmaßstäbliche modellversuche an schraubpfählen mit unterschiedlicher wendelkonfiguration unter lateraler belastung im sand (large-scale model tests on helical piles with different helix positions and sizes under lateral loading in sand). 2025
5. R. Hoedemaker. Effect of material heterogeneity on gas transport in clays: A numerical study. 2024
4. J. Zoutendijk. A cohesive-frictional mechanical constitutive law for zero-thickness interface elements. 2022
3. A. Escanellas. Fractura con viscoelasticidad en muestras de roca salina (fracture with viscoelasticity in samples of salt rock). 2020
2. E. Cámara. Ensayos wst de probetas de rocas salinas a distintas velocidades de carga (wedge splitting tests of salt rock specimens with different loading rates). 2019
1. A. Martínez. Ataque ácido en cementos de antiguos pozos en repositorios de co₂ (acid attack on well cements in co₂ repositories). 2016

Bachelor Theses

8. N. Seibert. Untersuchungen zur bestimmung der lagerungsdichte und der homogenität des bodenaufbaus in geotechnischen großversuchen (investigations on the density determination of soils and their homogeneity in geotechnical large-scale model tests). 2025
8. M. G. van Beek. Comparing soil water retention models for application in underground disposal of nuclear waste. 2020
7. E. Vacas. Estudio experimental de la influencia del estado tensional en las expansiones por reacción Álcali-sílice en hormigón (experimental study of the influence of the stress state in the expansions due to alkali-silica reaction in concrete). 2016
6. D. Navarro. Comportamiento triaxial de rocas de sondeos profundos (triaxial behavior of deep borehole rock specimens). 2015
5. A. Martínez. Estudio experimental de las expansiones por reacción Álcali-sílice a nivel de la interfase pasta de cemento-agregado (experimental study of the alkali-silica reaction expansions at the level of a single cement-aggregate interface). 2014
4. J. Casellas. Ensayos triaxiales de rocas en célula de gran capacidad (rock triaxial tests with a high capacity cell). 2013

3. A. González. Estudio experimental de las interfases árido-pasta afectadas por la reacción Álcali-silíce (experimental study of the cement-aggregate interfaces affected by the alkali-silica reaction). 2012
2. I. Acosta. Calibración y puesta en marcha de una nueva máquina de ensayo para hormigón afectado por la reacción Álcali-Árido (calibration and commissioning of a new testing machine for concrete affected by alkali-aggregate reactions). 2012
1. J. Stokes. An analysis of the design and assembly of the aar tri-axial machine. 2011

Technical Reports

11. Jacobs, E., & Kolditz, O. (editors). (2024). Gas transport mechanisms: diffusion, retention and advection processes. Task 2. Final technical report. EURAD-GAS: Work Package GAS (Mechanical understanding of gas transport in clay-based materials) of the HORIZON 2020 project EURAD. EC Grant agreement Nr. 847593, DOI: 10.3030/847593, May 2024
10. Marschall P., Talandier J., & Kolditz O. (editors). Barrier integrity: gas-induced impacts and model-based interpretation. EURAD-GAS: Work Package GAS (Mechanical understanding of gas transport in clay-based materials) of the HORIZON 2020 project EURAD. EC Grant agreement Nr. 847593, DOI: 10.3030/847593, May 2024
9. J. Liaudat, L. Barandiarán, and I. Carol. Hydro-mechanical 2phase coupling implementation (CD.2). *Research Report*, REPSOL S.A., grant No. C08608, February 2020
8. J. Liaudat, L. Barandiarán, and I. Carol. Hydro-mechanical 2phase coupling formulation (RD.1c) *Research Report*, REPSOL S.A., grant No. C08608, February 2020
7. J. Liaudat, L. Barandiarán, and I. Carol. Implementation of biphasic gas/water model under non-isothermal conditions (CD.4b). *Research Report*, REPSOL S.A., grant No. C08608, October 2019
6. J. Liaudat, L. Barandiarán, and I. Carol. Study of biphasic gas/water model under non-isothermal conditions (RD.1c). *Research Report*, REPSOL S.A., grant No. C08608, October 2019
5. J. Liaudat and I. Carol. Implementation of compressible flow (gas) model under isothermal conditions (CD.4A). *Research Report*, REPSOL S.A., grant No. C08608, January 2019
4. J. Liaudat and I. Carol. Study of compressible flow (gas) under isothermal conditions (RD.1B). *Research Report*, REPSOL S.A., grant No. C08608, October 2018
3. J. Liaudat and I. Carol. Mathematical description of multiphase flow model (RD.1A). *Research Report*, REPSOL S.A., grant No. C08608, October 2018
2. J. Liaudat, A. Martínez, P. Prat, and I. Carol. Experimental report with standard tests (Lab.2). *Research Report*, REPSOL S.A., grant No. C08608, March 2014
1. J. Liaudat, A. Martínez, P. Prat, and I. Carol. Experimental report with standard tests (Lab.1). *Research Report*, REPSOL S.A., grant No. C08608, November 2013

Datasets

8. Bourne-Webb, P. J., Bodas Freitas, T., Georgiadis, K., Livanidou, A.-C., Nunes Rodrigues, E. M., Borrhalho Gil, P. J., Marques, P., Wiening, C., Kochnev, A., Liaudat, J., & Zachert, H. (2025). GEOLAB - Transnational Access Project HELITEST: Testing and Advanced Modelling of Helical Steel Piles for Support & Recovery of Critical Infrastructure. Zenodo. <https://doi.org/10.5281/zenodo.15495048>
7. Yaba, O., Liaudat, J., Kochnev, A., el Ayoubi, A., Jenck, O., Emeriault, F., Vollmert, L., Szymkiewicz, F., & Zachert, H. (2025). GEOLAB - Transnational Access Project CyLo-RT: Cyclic loading of railway trackbeds with and without geogrid stabilisation. In Zenodo. <https://doi.org/10.5281/zenodo.15422965>
6. Chalhoub, R., Jenck, O., Liaudat, J., Kochnev, A., Dano, C., Abadie, C., Szymkiewicz, F., & Zachert, H. (2024). GEOLAB - SAM-WT project. In Zenodo. DOI: 10.5281/zenodo.13619596
5. Zachert, H., Machaček, J., Dogra, R., Kochnev, A., Kreuzer, J., & Liaudat, J. (2024). GEOLAB - Report on Pile Calibration Report. In GEOLAB - Report on Pile Calibration Report. DOI: 10.5281/zenodo.13340738

4. Beroya-Eitner, M. A., Machaček, J., Viggiani, G., Dastider, A. G., Thorel, L., Korre, E., Agalianos, A., Jafarian, Y., Zwanenburg, C., Lenart, S., Wang, H., Zachert, H., Stanier, S., & Liaudat, J. (2024). GEOLAB Material Properties Database. In Zenodo. DOI: 10.5281/zenodo.12697903
3. Liaudat, J., Machaček, J., & Hauke, Z. (2024). GEOLAB Blind Prediction Contest - Supporting Documentation. In Zenodo. DOI: 10.5281/zenodo.14186172
2. Liaudat, J. (2024). GASCLAY - Construction drawings of the Gas Fracturing Visualisation Rig. In 4TU.ResearchData. DOI: 10.4121/ba9b77e9-4db5-492a-a9bc-cc7251854fd7
1. Liaudat, J. (2024). GASCLAY - Uniaxial consolidation test on a reconstituted Boom clay sample. In 4TU.ResearchData. DOI: 10.4121/87d5e740-1834-4689-8004-7ab07961912d

PRESENTATIONS

International Conferences and Workshops

14. Multi-Scale Investigation and Modeling of Alkali-Silica Reaction in Concrete under Confinement, *IX International Workshop on Crystallization in Porous Media (CRYSPOM25)*, Barcelona, Spain, 17-19 September 2025.
13. Assessing repeatability, scale effects, and consistency in geotechnical physical modelling: a collaborative benchmark exercise on horizontally loaded piles in dry sand, *5th European Conference on Physical Modelling in Geotechnics (ECPMG2024)*, Delft, the Netherlands, 2-4 October 2024.
12. Modelling gas fracturing experiments in saturated clay using zero-thickness interface elements, *Symposium on Energy Geotechnics — Accelerating the Energy Transition*, Delft, the Netherlands, 3-5 October 2023.
11. Pneumo-Hydro-Mechanical triple-node zero- thickness cohesive interface element, *Third International Workshop on the Finite Element Code LAGAMINE (LAGASHOP 2022)*. Université de Grenoble Alpes, 5-7 July 2022.
10. Numerical modelling of discrete gas flow pathways in water saturated clay, *8th International conference on clays in natural and engineered barriers for radioactive waste confinement*, Nancy, France, 13-16 June, 2022
9. Numerical modelling of discrete gas flow pathways in water saturated clay, *2nd International Conference on Energy Geotechnics (ICEGT 2020)*. La Jolla, CA, USA, April 10-13, 2022.
8. Zero-thickness interface model with chemical degradation by acid attack, *XV International Conference on Computational Plasticity - Fundamentals and Applications (COMPLAS XV)*. Barcelona, Spain, Sept. 3–5, 2019.
7. Experimental and numerical study of the effect of stresses on ASR expansions in concrete, *MAI workshop and training session - Micromechanics of cementitious materials*, EDF Lab les Renardières, Ecuelles, France, Sept. 20, 2017.
6. Avoiding fracture instability in Wedge Splitting Tests by means of numerical simulations, *XIV International Conference on Computational Plasticity - Fundamentals and Applications (COMPLAS XIV)*. Barcelona, Spain, Sept. 5–7, 2017.
5. Modelling concrete expansions via coupled C-M mesoscale analysis with zero-thickness interface elements, and lab experiments, *Swelling Concrete in Dams and Hydraulic Structures (DSC 2017)*, Chambéry, France, 13–15 June, 2017.
4. Numerical Modelling of ASR Expansions in Concrete, *10th International Conference on Mechanics and Physics of Creep, Shrinkage, and Durability of Concrete and Concrete Structures (CON-CREEP 10)*, Wien, Austria, Sept. 21–23, 2015.
3. Numerical modelling of the Wedge Splitting Test in rock specimens, using fracture-based zero-thickness interface elements, *XIII International Conference on Computational Plasticity - Fundamentals and Applications (COMPLAS XIII)*. Barcelona, Spain, Sept. 1–3, 2015.
2. Diffusion-reaction model for Alkali-Silica Reaction in concrete, *XII International Conference on Computational Plasticity - Fundamentals and Applications (COMPLAS XII)*. Barcelona, Spain, Sept. 3–5, 2013.

1. ASR free expansion tests at the level of a single aggregate-matrix interface - Experimental results and numerical modeling, *VI International PhD Student Workshop in Durability of Reinforced Concrete - From Composition to Protection*, Delft University of Technology, Delft, The Netherlands, July 4–5, 2013.

Invited presentations

6. Time dependent behaviour of fracture propagation in salt rock, *TU Delft, Geo-engineering Section*, Delft, Netherlands, Nov. 2023.
5. Experimental study of the effect of stress on ASR expansions in concrete, *TU Delft, Geo-engineering Section*, Delft, Netherlands, Nov. 2020.
4. Numerical and experimental study of the effect of stress on ASR expansions in concrete, *Instituto de Investigaciones Antisísmicas, Universidad Nacional de San Juan*, San Juan, Argentina, July 2018.
3. Modelling concrete expansions via coupled C-M mesoscale analysis with zero-thickness interface elements, and lab experiments, *Instituto de Investigaciones Antisísmicas, Universidad Nacional de San Juan*, San Juan, Argentina, Aug. 2017.
2. Numerical modelling of the Wedge Splitting Test (WST) in rock specimens, using fracture-based zero-thickness interface elements, *Instituto de Investigaciones Antisísmicas, Universidad Nacional de San Juan*, San Juan, Argentina, Aug. 2017.
1. Experimental and Numerical study of ASR in concrete, *RILEM Technical Committee 259-ISR*, Empa Laboratory for Concrete/Construction Chemistry, Dübendorf, Switzerland, June 19–20, 2017.

Last updated: October, 2025