

PUBLICATIONS

- Fan, B., Cheng, Z., Wang, T., & Wang, S. (2025). Dynamic Response Characteristics and Liquefaction Analysis of a Phosphogypsum Tailings Dam. *International Journal of Geomechanics*, 25(1), 05024012. <https://doi.org/10.1061/IJGNAI.GMENG-922>
- Dawson, E. M. & Cheng, Z. (2024). Maxwell Damping, an Alternative to Rayleigh Damping in Seismic Analysis. *Itasca Software Webinar*. <https://www.youtube.com/watch?v=z9y3KbwxsU&t=558s>
- Cheng, Z. (2024). Implementation and Verification of Enhanced Munson-Dawson Creep Model for Rock Salt. *Proceedings, 58th U.S. Rock Mechanics/Geomechanics Symposium (ARMA, Golden, Colorado, June 2024)*. ARMA 24-109. Alexandria, Virginia: ARMA. <https://doi.org/10.56952/ARMA-2024-0109>
- Cheng, Z., Hazzard, J. & DeGagné, D. (2023). FLAC3D Version 9, What's New. *Itasca Software Webinar*. <https://www.youtube.com/watch?v=MIw828pO468>
- Dawson, E., & Cheng, Z. (2024). Maxwell Damping in FLAC3D: Verification and validation. *Proceedings, 6th International ITASCA Symposium on Applied Numerical Modeling in Geomechanics (Toronto, June 2024)*, Paper 05-01.
- Cheng, Z., & Dawson, E. M. (2022). Applications of Maxwell Damping for Time Domain Seismic Analyses. In *Geo-Congress 2022 (GSP 334, Geophysical and Earthquake Engineering and Soil Dynamics, Charlotte, North Carolina, March 2022)*. 531–540. ASCE. doi.org/10.1061/9780784484043.051
- Lemos, J. V., Dawson, E. M., & Cheng, Z. (2022). Application of Maxwell Damping in the Dynamic Analysis of Masonry Structures with Discrete Elements. *Int. J. Masonry Research and Innovation*, 7(6), 663–686. doi.org/10.1504/IJMRI.2022.126539
- Detournay C., Meng, G., Hou, J., Xu, J., Cheng, Z., Peterson, R., & Cundall, P. (2021). Numerical Simulation of Water Impoundment at a High Arch Dam Site. In *Proceedings, 4th International Conference on Numerical Modeling in Engineering (NME 2021, Ghent, Belgium, August 2021)*, Lecture Notes in Civil Engineering. Vol 217. pp. 27–39, M. A. Wahab, Ed. Springer.
- Dawson, E. M., & Cheng, Z. (2021). Maxwell Damping: An Alternative to Rayleigh Damping. In *Proceedings, GeoExtreme 2021 (Savannah, Georgia, November 2021)*. ASCE, 2021. doi.org/10.1061/9780784483701.004
- Cheng, Z., & Damjanac, B. (2021). Extension of Mohr-Coulomb Model Considering Opening and Closure of Tension Cracks. In *Proceedings, 55th U.S. Rock Mechanics/Geomechanics Symposium (ARMA, Houston, Texas, June 2021)*. ARMA 21-1157. Alexandria, Virginia: ARMA.
- Cheng, Z., & Detournay, C. (2021). Formulation, validation and application of a practice-oriented two-surface plasticity sand model. *Computers and Geotechnics*, 132. doi.org/10.1016/j.compgeo.2020.103984
- Ghazvinian, E., Garza-Cruz, T., Bouzeran, L., Fuenzalida, M., Cheng, Z., Cancino, C., and Pierce, M. (2020). Theory and Implementation of the Itasca Constitutive Model for Advanced Strain Softening (IMASS). In *MassMin 2020 (Proceedings, Eight International Conference & Exhibition on Mass Mining, Virtual Conference, December 2020)*. 451–461. Santiago: University of Chile.

Stuedlein, A. W., Li, W., Chen, Y., Liu, H., & Cheng, Z. (2020). Numerical Simulation of Pile Pinning-Type Lateral Spreading Mitigation Using XCC and Circular Piles. In *Proceedings, 17th World Conference on Earthquake Engineering (17WCEE, Sendai, Japan, September 2020)*, Paper 4b-0006.

Cao, A., Liu, J., Cheng, Z., Chu, W., & Wu, J. (2020). Distribution of Fiberglass Anchors Related to the Stability of Soil Tunnel Faces. In *IOP Conf. Series: Earth and Environmental Science (Beijing, October 2020)*. Vol. 570, 052024.

Hou, J., Xu, J., Meng, G., Chu, W., Cheng, Z., Detournay, C., & Cundall, P. (2020). Analysis of the Effect of Dam Impoundment at the Baihetan Site Using Coupled Fluid-Mechanical Elasto-Plastic Simulations. In *IOP Conf. Series: Earth and Environmental Science (Beijing, October 2020)*. Vol. 570, 022033.

Cheng, Z., & Jefferies, M. (2020). Implementation and Verification of NorSand Model in General 3D Framework. In *Geo-Congress 2020 (GSP 318, Geotechnical Earthquake Engineering and Special Topics, Minneapolis, Minnesota, February 2020)*. 10–19. Reston, Virginia: ASCE.
doi.org/10.1061/9780784482810.002

Cheng, Z. (2020). Prediction of Field Sand Cyclic Resistance in Terms of Relative State Parameter Index Using Numerical Experiments. In *Applied Numerical Modeling in Geomechanics 2020 (Proceedings, 5th International Itasca Symposium, Vienna, Austria, February 2020)*. Paper 02-03. Minneapolis, Minnesota: Itasca.

Cheng, Z. (2020). Chapter 33: Significance of Calibration Procedure Consistency. In *Model Tests and Numerical Simulations of Liquefaction and Lateral Spreading*. 635–637 B. Kutter, M. Manzari and M. Zeghal (Eds). Cham, Switzerland: Springer.

Li, W., Stuedlein, A.W., Chen, Y., Liu, H., & Cheng, Z. (2019). Response of Pile Groups with X and Circular Cross-sections Subject to Lateral Spreading: 3D Numerical Simulations. *Soil Dyn. Earthq. Eng.* 126(11), 105774. doi.org/10.1016/j.soildyn.2019.105774

Mohamed, K. M., Cheng, Z., & Rashed, G. (2019). Coal Rib Stability Based on the Strength Reduction of the Coal Mass Model. In *Proceedings, 53rd U.S. Rock Mechanics/Geomechanics Symposium (ARMA, New York City, June 2019)*. ARMA 19-2844. Alexandria, Virginia: ARMA.

Cheng, Z. (2018). A Practical 3D Bounding Surface Plastic Sand Model for Geotechnical Earthquake Engineering Application. In *Proceedings, Geotechnical Earthquake Engineering and Soil Dynamics V: Numerical Modeling and Soil Structure Interaction (Austin, Texas, June 2018)*, pp. 34–47. S.J. Brandenberg and M.T. Manzari, Eds. ASCE. doi.org/10.1061/9780784481479.004

Lucarelli, A., & Cheng, Z. (2016). Plastic Hardening Model III: Design Application. In *Applied Numerical Modeling in Geomechanics — 2016 (Proceedings, 4th Itasca Symposium on Applied Numerical Modeling, Lima, March 2016)*. pp. 403–414, P. Gómez, C. Detournay, R. Hart, and M. Nelson, Eds. Minneapolis: Itasca Consulting Group, Inc.

Cheng, Z., & Lucarelli, A. (2016). Plastic Hardening Model II: Calibration and Validation. In *Applied Numerical Modeling in Geomechanics — 2016 (Proceedings, 4th Itasca Symposium on Applied Numerical*

Modeling, Lima, March 2016). pp. 393–402, P. Gómez, C. Detournay, R. Hart, and M. Nelson, Eds. Minneapolis: Itasca Consulting Group, Inc.

Cheng, Z., & Detournay, C. (2016). Plastic Hardening Model I: Implementation in *FLAC3D*. In *Applied Numerical Modeling in Geomechanics — 2016 (Proceedings, 4th Itasca Symposium on Applied Numerical Modeling, Lima, March 2016)*. pp. 267–276, P. Gómez, C. Detournay, R. Hart, and M. Nelson, Eds. Minneapolis: Itasca Consulting Group, Inc.

Pan, D., Cheng, Z., & Lucarelli, A. (2016). Natural Frequency Analysis of a Wind Farm Turbine-Pile-Foundation System. In *Proceedings, Geotechnical and Structural Engineering Congress 2016 (Phoenix, February 2016)*. pp. 1127–1137. C.Y. Chandran, M.I. Hoit, Eds. Reston: ASCE.
doi.org/10.1061/9780784479742.094

Pan, D., Lucarelli, A., & Cheng, Z. (2016). Field Test of Monopiles for Offshore Wind Turbine Foundations. In *Proceedings, Geotechnical and Structural Engineering Congress 2016 (Phoenix, February 2016)*. pp. 1138–1152. C.Y. Chandran, M.I. Hoit, Eds. Reston: ASCE. doi.org/10.1061/9780784479742.095

Cheng, Z., Dafalias, Y. F., & Manzari, M. T. (2013). Application of SANISAND Dafalias-Manzari Model in *FLAC3D*. In *Continuum and Distinct Element Numerical Modeling in Geomechanics - 2013 (Proceedings, 3rd International FLAC/DEM Symposium, Hangzhou, China, October 2013)*. H. Zhu, C. Detournay, R. Hart, and M. Nelson, Eds. Minneapolis: Itasca International, Inc.

Cheng, Z., and Law, H. (2011). Chapter 6: Parametric Studies, in *Design Guidelines for Increasing the Lateral Resistance of Highway-Bridge Pile Foundations by Improving Weak Soils*, pp. 61–75, NCHRP 697. Transportation Research Board, National Cooperative Highway Research Program, Washington D.C.

Cheng, Z., & Law, H. (2011). Chapter 5: Finite Element Modeling of Pile Group Load Tests. In *Design Guidelines for Increasing the Lateral Resistance of Highway-Bridge Pile Foundations by Improving Weak Soils*. pp. 54–60, NCHRP 697. Transportation Research Board, National Cooperative Highway Research Program, Washington D.C., 2011.

Cheng, Z., and Law, H. (2011). Chapter 4: Finite Element Modeling of Single Pile Load Test, in *Design Guidelines for Increasing the Lateral Resistance of Highway-Bridge Pile Foundations by Improving Weak Soils*, pp. 51–53, NCHRP 697. Transportation Research Board, National Cooperative Highway Research Program, Washington D.C.

Cheng, Z., Law, H., & Rollins, K. M. (2010). Effects of Soil Improvement by Mass Mixing on the Lateral Capacity of Pile Group Using Finite Element Method. In *Advances in Analysis, Modeling, & Design, ASCE Geotechnical Special Publication, No. 199*, pp. 1412-1421. D. Fratta et al., Eds. Reston, Virginia: ASCE.

Cheng, Z., Law, H., & Jiang, Y. (2010). Soil-Structure Interaction Analysis for Bridge Caisson Foundation. In *Proceedings, Fifth International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics (San Diego, California, May 2010)*. Paper No 5.55a. S. Prakash, Ed. Rolla, Missouri: Missouri S&T.

Taiebat, M., Jeremic, B., Dafalias, Y. F., Kaynia, A. M., & Cheng, Z. (2010). Propagation of Seismic Waves through Liquefied Soils. *Soil Dyn. Earthq. Eng.*, 30(4), 236-257. doi.org/10.1016/j.soildyn.2009.11.003

Cheng, Z., & Jeremic, B. (2009). Numerical Modeling and Simulation of Pile in Liquefiable Soil. *Soil Dyn. Earthq. Eng.*, 29(11-12), 1405-1426. doi.org/10.1016/j.soildyn.2009.02.008

Cheng, Z., & Jeremic, B. (2009). Numerical Modeling and Simulation of Soil Lateral Spreading against Piles. In *Contemporary Topics in In-Situ Testing, Analysis, and Reliability of Foundations*, ASCE Geotechnical Special Publication, No 186, pp 183-189. M. Iskander et al., Eds. Reston, Virginia: ASCE.

Jeremic, B., & Cheng, Z. (2009). On Large Deformation Hyperelasto-Plasticity of Anisotropic Materials. *Commun. Num. Meth. Eng.*, 25(4), 391-400. 2009.

Xiong, Y., Hofmeister, W. H., Cheng, Z., Smugeresky, J. E., Lavernia, E. J., & Schoenung, J. M. (2009). In-Situ Thermal Imaging and Three-Dimensional Finite Element Modeling of Tungsten Carbide-Cobalt during Laser Deposition. *Acta Materialia*, 57(18), 5419-5429. doi.org/10.1016/j.actamat.2009.07.038

Jeremic, B., Cheng, Z., Taiebat, M., & Dafalias, Y. F. (2008). Numerical Simulation of Fully Saturated Porous Materials. *Int. J. Num. Anal. Meth. Geomech.*, 32(13), 1635-1660. doi.org/10.1002/nag.687

Taiebat, M., Jeremic, B., Cheng, Z., & Dafalias, Y. F. (2008). Numerical Simulation of Seismic Ground Motion Isolation Using Fully Coupled Nonlinear Response in Saturated Sands. In *Geotechnical Earthquake Engineering and Soil Dynamics IV*. ASCE Geotechnical Special Publication, No 181. Z. David et al., Eds. Reston, Virginia: ASCE.

Cheng, Z., Taiebat, M., Jeremic, B., & Dafalias, Y. F. (2007). Issues in Modeling and Simulation of Soil Liquefaction. In *Proceedings, Fourth International Conference on Earthquake Geotechnical Engineering (Thessaloniki, Greece, June 2007)*. K. D. Pitilaki, Ed. Netherlands: Springer.

Cheng, Z., Taiebat, M., Jeremic, B., & Dafalias, Y. F. (2007). Modeling and Simulation of Saturated Geomaterials. In *Dynamic Response and Soil Properties, New Peaks in Geotechnics*. ASCE Geotechnical Special Publication, No 160. M. M. Dewoolkar and J. P. Koester, Eds. Reston, Virginia: ASCE.

Cheng, Z., & Jeremic, B. (2005). A Return Mapping Algorithm for Isotropic and Anisotropic Large Deformations. In *Computational Fluid and Solid Mechanics (Proceedings, 3rd MIT Conference on Computational Fluid and Solid Mechanics, MIT, Boston, June 2005)*. pp. 1076-1081. K. J. Bathe, Ed. Amsterdam: Elsevier Ltd.

Jeremic, B., & Cheng, Z. (2005). Significance of Equal Principal Stretches in Computational Hyperelasticity. *Commun. Num. Meth. Eng.*, 21(9), 477-486.

Cheng, Z., Chen, S.-H., Tian, S.-L., & Ge, X.-R. (2002). Modified SSOR-PCG Solver for Large-Scale P-Version FEM Equations. *J. Shanghai Jiaotong Univ.*, 36(11), 1608-1611.

Chen, S.-H., & Cheng, Z. (2001). Study on P-Version Adaptive Finite Element Method for Analysis of Hydraulic Structure. *J. Hydraulic Engineering*, 2001(11), 62-69.

Cheng, Z., & Chen, S.-H. (1999). 3D Hierarchical FEM Analysis for Hydraulic Structures. *J. Hydraulic Engineering*, 1999(12), 53-58.