

PUBLICATIONS

Wang, S., Potyondy, D.O., Chu, W., Zhang, L., Zhao, X., & Wang, T. (2024). Investigation of Meso-mechanical Properties of Jinping Dolomitic Marble Based on Flat-Joint Model. *J. Rock Mech. Geotech. Eng.* In Press. <https://doi.org/10.1016/j.jrmge.2024.05.020>

Potyondy, D.O., & Fu, W. (2024). A 3D Subspring Network Breakable Voronoi Model for Rock: Laboratory-Scale Behavior. In *Proceedings, 58th U.S. Rock Mechanics/Geomechanics Symposium (ARMA, Golden, Colorado, USA, June 2024)*, ARMA 24-493. Alexandria, Virginia: ARMA.

Potyondy, D., & Purvance, M. (2024). A 3D Subspring Network Breakable Voronoi model for rock: Grain-breakage scheme. In *Proceedings, 6th International ITASCA Symposium on Applied Numerical Modeling in Geomechanics (Toronto, June 2024)*, Paper 04-01.

Hu, W. R., Liu, K., Potyondy, D. O., Salmi, E. F., Sellers, E. J., & Zhang, Q. B. (2023). Grain-Based Modelling of Dynamic Shear Rupture of Heterogeneous Rock Using a Coupled Continuum-Discrete Model. *International Journal of Impact Engineering*, 172, 104420. <https://doi.org/10.1016/j.ijimpeng.2022.104420>.

Hazzard, J.F., Potyondy, D.O., & Purvance, M. (2022). Recent Advances in Discrete Element Modeling. In *RockEng22 (Proceedings, 22nd Canadian Rock Mechanics Symposium, Kingston, August 2022)*.

Hu, W. R., Liu, K., Potyondy, D. O., & Zhang, Q. B. (2020). 3D Continuum-Discrete Coupled Modelling of Triaxial Hopkinson Bar Tests on Rock under Multiaxial Static-Dynamic Loads. *Int. J. Rock Mech. & Min. Sci.*, 134, 104448. <https://doi.org/10.1016/j.ijrmms.2020.104448>.

Lorig, L., Potyondy, D., & Varun. (2020). Quantifying Excavation-Induced Rock Mass Damage in Large Open Pits. In *Proceedings, 2020 International Symposium on Slope Stability in Open Pit Mining and Civil Engineering (Virtual Conference, May 2020)*, 969–982. Perth: Australian Centre for Geomechanics.

Dahal, B., Mishra, D., & Potyondy, D. (2020). Application of PFC3D to Study Railroad Ballast Breakage Response under Train Loading. In *Applied Numerical Modeling in Geomechanics 2020 (Proceedings, 5th International Itasca Symposium, February 2020)*, Paper 03-04. Minneapolis, Minnesota: Itasca.

Hu, W., Potyondy, D., & Zhang, Q. (2020). FLAC3D-PFC3D Coupled Simulation of Triaxial Hopkinson Bar. In *Applied Numerical Modeling in Geomechanics 2020 (Proceedings, 5th International Itasca Symposium, February 2020)*, Paper 05-01. Minneapolis, Minnesota: Itasca.

Potyondy, D. O., & Mas Ivars, D. (2020). Simulating Spalling with a Flat-Jointed Material. In *Applied Numerical Modeling in Geomechanics 2020 (Proceedings, 5th International Itasca Symposium, February 2020)*, Paper 03-01. Minneapolis, Minnesota: Itasca.

Potyondy, D., Lorig, L., & Purvance, M. (2019). The Effect of Rock Mass Damage on Strength Degradation in Large Open Pits. In *Proceedings, ISRM 14th International Congress of Rock Mechanics (Iguassu Falls, Brazil, September 2019)*, pp. 2450–2460. ISRM.

- Potyondy, D. O. (2018). A Flat-Jointed Bonded-Particle Model for Rock. In *Proceedings, 52nd U.S. Rock Mechanics/Geomechanics Symposium (ARMA, Seattle, Washington, June 2018)*, ARMA 18-1208. Alexandria, Virginia: ARMA.
- Mahmud, S. M. N., Mishra, D., & Potyondy, D. O. (2018). Effect of Geogrid Inclusion on Ballast Resilient Modulus: The Concept of 'Geogrid Gain Factor'. In *Proceedings, 2018 Joint Rail Conference (Pittsburgh, PA, April 2018)*, JRC2018-6126. ASME.
- Potyondy, D. O. (2017). Simulating Perforation Damage with a Flat-Jointed Bonded-Particle Material. In *Proceedings, 51st U.S. Rock Mechanics/Geomechanics Symposium (San Francisco, California, June 2017)*, ARMA 17-223. Alexandria, Virginia: ARMA.
- Siekmeier, J., Bittmann, J., Potyondy, D., & Petersen, L. (2016). Introducing a Geogrid Gain Factor for Flexible Pavement Design. In *Proceedings, University of Minnesota 64th Annual Geotechnical Engineering Conference (Minneapolis, March 2016)*, J. F. Labuz and A. B. Carney, Eds. Minneapolis: University of Minnesota.
- Potyondy, D., Siekmeier, J., & Petersen, L. (2016). Aggregate-Geogrid Interaction Model Incorporating Moisture Effects. In *Proceedings, Transportation Research Board 2016 Annual Meeting (Washington, D.C., January 2016)*, 16–6085. Washington, D.C.: National Academy of Sciences.
- Potyondy, D. (2015). The Bonded-Particle Model as a Tool for Rock Mechanics Research and Application: Current Trends and Future Directions. *Geosystem Engineering*, 18(1), 1–28. doi: 10.1080/12269328.2014.998346.
- Ostanin, I., Ballarini, R., Potyondy, D., & Dumitrica, T. (2013). A Distinct Element Method for Large Scale Simulations of Carbon Nanotube Assemblies. *Journal of the Mechanics and Physics of Solids*, 61, 762–782.
- Bahrani, N., Potyondy, D., & Pierce, M. (2012). Simulation of Brazilian Test Using PFC2D Grain-Based Model. In *21st Canadian Rock Mechanics Symposium: RockEng12 — Rock Engineering for Natural Resources (Proceedings, CARMA, Edmonton, Canada, May 2012)*, pp. 485–493, C. Hawkes, Ed. Westmount, Quebec: CARMA, CIMICM.
- Katsaga, T., & Potyondy, D. O. (2012). A Generic Stope Model for Investigation of Fracturing Mechanisms in Deep Gold Mines. In *46th US Rock Mechanics / Geomechanics Symposium (Proceedings, ARMA, Chicago, June 2012)*. ARMA 12-541. Alexandria, Virginia: ARMA.
- Potyondy, D. O. (2012). A Flat-Jointed Bonded-Particle Material for Hard Rock. In *46th U.S. Rock Mechanics / Geomechanics Symposium (Proceedings, ARMA, Chicago, June 2012)*. Paper No. 12-501. Alexandria, Virginia: ARMA.
- Potyondy, D. O. (2012). The Bonded-Particle Model as a Tool for Rock Mechanics Research and Application: Current Trends and Future Directions. In *The Present and Future of Rock Engineering (Proceedings, ARMS7 — The 7th Asian Rock Mechanics Symposium / 2012 ISRM Regional Symposium, Seoul, Korea, October 2012)*, pp. 73–105. Seoul: The Korean Science and Technology Center.

Mas Ivars, D., Pierce, M. E., Darcel, C., Reyes-Montes, J., Potyondy, D. O., Young, R. P., & Cundall, P. A. (2011). The Synthetic Rock Mass Approach for Jointed Rock Mass Modelling. *Int. J. Rock Mech. Min. Sci.*, 48, 219–244.

Potyondy, D. O. (2011). Parallel-Bond Refinements to Match Macroproperties of Hard Rock. In *Continuum and Distinct Element Modeling in Geomechanics — 2011 (Proceedings, 2nd International FLAC / DEM Symposium (Melbourne, February 2011))*, Paper No. 08-04, pp. 459–465. D. Sainsbury et al., Eds. Minneapolis: Itasca International Inc.

Purvance, M. D., Russell, D., Potyondy, D., & Emam, S. (2011). Spatial Searching and Contact Detection in PFC 5.0. In *Continuum and Distinct Element Modeling in Geomechanics — 2011 (Proceedings, 2nd International FLAC / DEM Symposium (Melbourne, February 2011))*, Paper No. 14-01, pp. 783–790. D. Sainsbury et al., Eds. Minneapolis: Itasca International Inc.

Anderson, T., Akatyeva, E., Nikiforov, I., Potyondy, D., Ballarini, R., & Dumitrică, T. (2010). Toward Distinct Element Method Simulations of Carbon Nanotube Systems. *J. Nanotechnol. Eng. Med.*, 1, 041009-2, doi: 10.1115/1.4002609.

Potyondy, D. (2010). A Grain-Based Model for Rock: Approaching the True Microstructure. In *Proceedings, Bergmekanikk i Norden 2010 — Rock Mechanics in the Nordic Countries 2010 (Kongsberg, Norway, June 2010)*, pp. 225–234. C. C. Li et al., Eds. Oslo: Norwegian Group for Rock Mechanics.

Mas Ivars, D., Potyondy, D. O., Pierce, M., & Cundall, P. A. (2008). The Smooth-Joint Contact Model (Abstract). In *Proceedings, WCCM8 — ECCOMAS 2008 (8th World Congress on Computation Mechanics / 5th European Congress on Computational Methods in Applied Sciences & Engineering, Venice, June-July 2008)*, Paper No. a2735. B. A. Schrefler and U. Perego, Eds. Barcelona: International Center for Numerical Methods in Engineering (CIMME).

Potyondy, D., & Hazzard, J. (2008). Effects of Stress and Induced Cracking on the Static and Dynamic Moduli of Rock. In *Continuum and Distinct Element Numerical Modeling in Geo-Engineering (Proceedings, 1st International FLAC / DEM Symposium, Minneapolis, August 2008)*, Paper No. 04-03. R. Hart et al., Eds. Minneapolis: Itasca.

Mas Ivars, D., Pierce, M., Potyondy, D. O., & Cundall, P. A. (2007). A New Modelling Approach for the Study of Deformation, Yield and Failure of Jointed Rock Masses. In *Bergmekanikdag 2007 (Swedish Rock Mechanics Day 2007)*, pp. 33–41. Stockholm: SveBeFo.

Pierce, M., Cundall, P., Potyondy, D., & Mas Ivars, D. (2007). A Synthetic Rock Mass Model for Jointed Rock. In *Rock Mechanics: Meeting Society's Challenges and Demands (1st Canada-U.S. Rock Mechanics Symposium, Vancouver, May 2007)*, Vol. 1: *Fundamentals, New Technologies & New Ideas*, pp. 341–349. E. Eberhardt et al., Ed. London: Taylor & Francis Group.

Potyondy, D. O. (2007). The Effect of Voids on the Mechanical Properties of Rock. In *DEM 07 (Proceedings, Discrete Element Modelling Conference, Brisbane, August 2007)*. Minerals Engineering International.

Potyondy, D. O. (2007). Simulating Stress Corrosion with a Bonded-Particle Model for Rock. *Int. J. Rock Mech. Min. Sci.*, 44, 677–691.

Potyondy, D. (2005). Formulation of a Bonded-Particle Model to Simulate Stress Corrosion in Rock. In *11th International Conference on Fracture (ICF11, Turin, Italy, March 2005)*, p. 252, Extended Abstract No. 3469.

Potyondy, D. O., & Cundall, P. A. (2004). A Bonded-Particle Model for Rock. *Int. J. Rock Mech. & Min. Sci.*, 41(8), 1329–1364.

Young, R. P., Collins, D. S., Hazzard, J., Heath, A., Pettitt, W. S., Baker, C., Billaux, D., Cundall, P., Potyondy, D., Dedecker, F., Svemar, C., & Lebon, P. (2004). An Innovative 3-D Numerical Modelling Procedure for Simulating Repository-Scale Excavations in Rock — SAFETI, presented at the Euradwaste'04 Conference on Radioactive Waste Management Community Policy and Research Initiatives (Luxembourg, March 2004), Poster P37; in *Programme and Abstracts from the Sixth European Commission Conference on the Management and Disposal of Radioactive Waste (EURADWASTE '04), Luxembourg, March-April 2004*, Poster P37.

Young, R. P., Collins, D. S., Hazzard, J., Heath, A., Baker, C., Pettitt, W. S., Billaux, D., Cundall, P., Potyondy, D., Dedecker, F., & Svemar, C. (2003). An Innovative 3-D Numerical Modelling Procedure for Simulating Repository-Scale Excavations in Rock — SAFETI. In *The Performance of Radioactive Waste Geological Repositories (Proceedings, CLUSTER Conference on Impact of the EDZ, Luxembourg, 2003)*.

Autio, J., Wanne, T., & Potyondy, D. (2002). Particle Mechanical Simulation of the Effect of Schistosity on Strength and Deformation of Hard Rock. In *NARMS-TAC 2002: Mining and Tunnelling Innovation and Opportunity*, Vol. 1, pp. 275–282. R. Hammah et al., Eds. Toronto: University of Toronto Press.

Chandler, N., Read, R., Potyondy, D., Young, R. P., & Hazzard, J. (2002). Computing Brittle Rock Fracture and Excavation Stability Using the Particle Flow Code. In *Proceedings, 2nd Canadian Specialty Conference on Computer Applications in Geotechnique (Winnipeg, April 2002)*, pp. 104–111. Alliston, Ontario, Canada: Canadian Geotechnical Society.

Pierce, M. E., Potyondy, D., Andrieux, P., & Lessard, J.-S. (2002). Use of the Particle Flow Code (PFC2D) to Assess Stability of Undercut Rockfill at Brunswick Mine. In *NARMS-TAC 2002: Mining and Tunnelling Innovation and Opportunity*, Vol. 1, pp. 173–180. R. Hammah et al., Eds. Toronto: University of Toronto Press.

Potyondy, D. (2002). A Bonded-Disk Model for Rock: Relating Microproperties and Macroproperties. In *Discrete Element Methods: Numerical Modeling of Discontinua (Proceedings, Third International Conference, Santa Fe, September 2002)*, pp. 340–345. B. K. Cook and R. P. Jensen, Eds. Reston, Virginia: ASCE.

Potyondy, D., & Autio, J. (2001). Bonded-Particle Simulations of the In-Situ Failure Test at Olkiluoto. In *Rock Mechanics in the National Interest (Proceedings, 38th U.S. Rock Mechanics Symposium, Washington, D.C., July 2001)*, Vol. 2, pp. 1553–1560. Lisse: Balkema.

Chandler, N., Read, R., Cundall, P., Potyondy, D., Detournay, E., Young, R. P., & Lau, J.S.O. (2000). An Integrated Approach to Excavation Design — A Project Within Canada's Used Fuel Disposal Program. In *Pacific Rocks 2000: Rock Around the Rim (Proceedings, 4th North American Rock Mechanics Symposium, Seattle, July-August 2000)*, pp. 1271–1278. J. Girard et al., Eds. Rotterdam: Balkema.

Potyondy, D. O., & Fairhurst, C. E. (1999). The Value of Numerical Modeling in Understanding the Complete Load / Deformation Behavior of Cohesive-Frictional Materials. In *Nondestructive and Automated Testing for Soil and Rock Properties, ASTM STP 1350*, pp. 290–299. W. A. Marr and C. E. Fairhurst, Eds. West Conshohocken, Pennsylvania: ASTM.

Potyondy, D. O., & Cundall, P. A. (1998). Modeling Notch-Formation Mechanisms in the URL Mine-by Test Tunnel Using Bonded Assemblies of Circular Particles. *Int. J. Rock Mech. & Min. Sci.*, 35(4-5); Special Issue (*Proceedings, NARMS '98, 3rd North American Rock Mechanics Symposium, Cancun, Mexico, June/July 1998*), Paper No. 067.

Cundall, P. A., Konietzky, H., & Potyondy, D. O. (1996). PFC — Ein Neues Werkzeug für Numerische Modellierungen. *Bautechnik*, 73(8), 492–498.

Cundall, P. A., Potyondy, D. O., & Lee, C. A. (1996). Micromechanics-Based Models for Fracture and Breakout Around the Mine-by Tunnel. In *Designing the Excavation Disturbed Zone for a Nuclear Repository in Hard Rock (Proceedings, Excavation Disturbed Zone Workshop, 1996 Canadian Nuclear Society International Conference on Deep Geological Disposal of Radioactive Waste, Winnipeg, Manitoba, September 1996)*, pp. 113–122. J. B. Martino and C. D. Martin, Eds. Toronto: Canadian Nuclear Society.

Cundall, P. A., Lorig, L. J., & Potyondy, D. O. (1996). Distinct-Element Models of Explosion-Induced Failure of Rock, Including Fragmentation and Gas Interaction. In *Explosion Effects in Granular Materials*, pp. 369–394. J. Jenssen et al., Eds. Oslo: Norwegian Defense Construction Service.

Potyondy, D. O., Cundall, P. A., & Sarracino, R. S. (1996). Modeling of Shock-and Gas-Driven Fractures Induced by a Blast Using Bonded Assemblies of Spherical Particles. *Rock Fragmentation by Blasting (Proceedings, Fifth International Symposium on Rock Fragmentation by Blasting, B FRAGBLAST 5, Montréal, Québec, August 1996)*, pp. 55–62. B. Mohanty, Ed. Rotterdam: Balkema.

Potyondy, D. O., Cundall, P. A., & Lee, C. (1996). Modeling Rock Using Bonded Assemblies of Circular Particles. In *Rock Mechanics Tools and Techniques (Proceedings, Second North American Rock Mechanics Symposium, Montréal, June 1996)*, pp.1937–1944. M. Aubertin, et al., Eds. Rotterdam: Balkema.

Lorig, L., Board, M. P., Potyondy, D. O., & Coetzee, M. J. (1995). Numerical Modeling of Caving Using Micro-Mechanical Models. In *CAMI '95 (Proceedings, Third Canadian Conference on Computer Applications in the Mineral Industry, October 1995)*, pp. 416–425. H. S. Mitri, Ed. Montréal: McGill University Press.

Potyondy, D. O., Wawrzynek, P. A., & Ingraffea, A. R. (1995). An Algorithm to Generate Quadrilateral or Triangular Element Surface Meshes in Arbitrary Domains with Applications to Crack Propagation. *Int. J. Num. Methods Eng.*, 38(16), 2677–2701.

Viz, M. J., Potyondy, D. O., Zehnder, A. T., Rankin, C. C., & Riks, E. (1995). Computation of Membrane and Bending Stress Intensity Factors for Thin, Cracked Plates. *Int. J. Frac.*, 72, 21–38.

Gray, L. J., Potyondy, D. O., Lutz, E. D., Wawrzynek, P. A., Martha, L. F., & Ingraffea, A. R. (1994). Crack Propagation Modeling. *Math. Models & Methods App. Sci.*, 4(2), 179–202.

Potyondy, D. O., Wawrzynek, P. A., & Ingraffea, A. R., (1995). Discrete Crack Growth Analysis Methodology for Through Cracks in Pressurized Fuselage Structures. *IJNME*, 38(10), 1611–1633; also in shortened form in *Proceedings, FAA / NASA Advanced Structural Integrity Methods for Airframe Durability and Damage Tolerance (Hampton, Virginia, May 1994)*, NASA Conference Publication 3274, Part 2, pp. 581–602. Hampton, Virginia: NASA Langley Research Center.

Shenoy, V. B., Potyondy, D. O., & Atluri, S. N. (1994). A Methodology for Computing Nonlinear Fracture Parameters for a Bulging Crack in a Pressurized Aircraft Fuselage. *Comp. Mech.*, 14, 529–548.

Wawrzynek, P. A., Carter, B. J., Ingraffea, A. R., & Potyondy, D. O. (1994). A Topological Approach to Modeling Arbitrary Crack Propagation in 3D. In *DIANA Computational Mechanics '94*, pp. 69–84. The Netherlands: G.M.A. Kusters and M.A.N. Hendriks, Eds. Kluwer Academic.

Potyondy, D. O. (1993). *A Software Framework for Simulating Curvilinear Crack Growth in Pressurized Thin Shells*, Ph.D. Thesis, Cornell University, August 1993.

Potyondy, D. O., & Ingraffea, A. R. (1992). A Methodology for Simulation of Curvilinear Crack Growth in Pressurized Fuselage. In *Durability of Metal Aircraft Structures (Proceedings, International Workshop on Structural Integrity of Aging Airplanes)*, pp. 217–230. S. N. Atluri et al., Eds. Atlanta: Atlanta Technology Publications.

Potyondy, D. O., Gray, L. J., & Ingraffea, A. R. (1992). Simulation of 3-D Non-Planar Fatigue Crack Growth in a Turbine Blade Root. In *Computer Technology: Advances and Applications (Proceedings, ASME Pressure Vessels and Piping Conference)*, pp. 31–42. R. S. Gallagher and G. M. Hulbert, Eds. New York: ASME.

Andrews, J. R., Stinehour, J. E., Lean, M. H., Potyondy, D. O., Wawrzynek, P. A., Ingraffea, A. R., & Rainsdon, M. D. (1991). Holographic Display of Computer Simulations. In *Practical Holography V*, SPIE Vol. 1461, pp. 110–123. S. A. Benton, Ed. Bellingham, Washington: SPIE-ISOE.

Potyondy, D. O. (1990). *Toward the Simulation of Three Dimensional Reinforced Concrete Subassemblages*, M.S. Thesis, Cornell University, May 1990.

Potyondy, D. O., Abel, J. F., & Ingraffea, A. R. (1990). An Interactive Environment for the Simulation of 3-D Reinforced Concrete Subassemblages. In *Computer Aided Analysis and Design of Concrete Structures*, Vol. 1, pp. 503–514. N. Bicanic and H. Mang, Eds. Swansea, U.K.: Pineridge Press.

Potyondy, D. O. (1984). Solving Real Engineering Problems. *CURA Reporter (Center for Urban and Regional Affairs, University of Minnesota)*, XIV(1), 9–11 (January 1984).