

# ***Proceedings of the 1<sup>st</sup> International FLAC/DEM Symposium***

## ***Preliminary\* Table of Contents***

(\*This is a preliminary list of papers – some papers have not received final approval for publication)

### ***Slope Stability***

Influence of rock-strength spatial variability on slope stability

*M. Jefferies, L. Lorig & C. Alvarez*

A study of cliffs subject to degradation by DEM (*PFC<sup>2D</sup>*)

*S. Utili & R. Nova*

On modeling of slope stability using *UDEC*

*M. Tabbara & G. Karam*

Stability of a slope in unsaturated conditions

*C. Detournay & R. Hart*

Modifications of *PFC<sup>3D</sup>* for rock mass fall modeling

*R. Poisel & A. Preh*

Landslide stabilization using drilled shafts

*D. Pradel & R. Carrillo*

Reinforced slope stability analysis with *FLAC*

*M. Cala & M. Kowalski*

Application of distinct element code, *PFC<sup>3D</sup>*, for simulating effects of tunnel failure on slope surface

*S. Kuraoka & T. Makino*

### ***Numerical Techniques***

Automatic grid generation, property rezoning & geomechanical analysis of Petrel-ECLIPSE petroleum reservoir data with *FLAC<sup>3D</sup>*

*J. Adachi, T. Hartman, L. Lomas, R. Plumb, I. Gil, M. Sanchez & R. Taghavi*

Automatic remeshing logic in large strain continuum simulations

*Y. Han, P.A. Cundall & R. Hart*

### ***Coupled Processes***

Determination of aquifer and aquitard properties by inverse hydromechanical modeling

*M.J. Burlingame*

Modeling of the separation process in a ferrohydrostatic separator using *PFC<sup>3D</sup>*

*V. Murariu*

Evaluating *3DEC* as a possible code for the characterization of nuclear reactor internal structures (Part I of II)

*D.K. McKellar*

Determining a structure-particle interaction using *PFC*<sup>3D</sup> (Part II of II)

*A.G. Polson & N.F. du Plooy*

Thermo-hydronechanical analysis of a dam using *FLAC*<sup>3D</sup> software

*C. Bourdeau, D. Billaux & A.F. Chraibi*

## **Fracture Propagation**

J-integral based fracture model for fluid filled porous medium

*M.Y.A. Ng, A. Klar & K. Soga*

Determination of fracture openings in rock masses

*P. Alfonsi & S. Grelaud*

Effects of stress and induced cracking on the static and dynamic moduli of rock

*D.O. Potyondy & J.F. Hazzard*

Discrete element simulation of crack growth in a single grain

*C.Y. Kwok, M.D. Bolton & Y.P. Cheng*

Modeling of unrelieved rock cutting test by using *PFC*<sup>3D</sup>

*O. Su & N.A. Akcin*

## **Tectonics**

Numerical experiments to investigate faulting and the dynamics of tectonic processes

*T.R. Harper*

Particle modeling of brecciation

*A. Ord, B.E. Hobbs, S. Mikula & H. Sheldon*

Numerical modeling of stress-strain state of the earth's crust of the Caspian region

*I.A. Garagash & A.V. Dubovskaya*

Fault propagation folding modeling with *FLAC*

*N. Cardozo & F. Cuisiat*

Stress distribution in the footwall of an active normal fault

*T.R. Harper & T.N. Pritchard*

Using *PFC*<sup>2D</sup> to investigate volcanic debris avalanche emplacement processes and deposit features with special consideration to Mexican volcanic collapse deposits

*N. Thompson*

## **Material Behavior**

Anisotropy and scale dependency in jointed rock-mass strength – A Synthetic Rock Mass Study

*D. Mas Ivars, M. Pierce, D. DeGagné & C. Darcel*

Simulation of rock-mass strength anisotropy and scale effects using a Ubiquitous Joint Rock Mass (URJM) model

*B. Sainsbury, M. Pierce & D. Mas Ivars*

Numerical prediction of stress-strain response of jointed rocks

*G. Arunakumari & G. Madhavi Latha*

Determination of specific rockmass failure envelope via *PFC* and its subsequent application using *FLAC*

*D. Saiang*

Investigation of core stress memory using discrete particle modeling

*S. Gorodkov, R.M. Holt & L. Li*

Numerical prediction of a centrifuge model – implications to rock engineering using *FLAC*

*M. Tsesarsky & M.L. Talesnick*

The Cysoil model: a simple strain hardening constitutive model for soft and stiff soils

*C. Detournay & P. Cundall*

A *FLAC*-based constitutive model for collapsible loess: analytical formulation and application

*B. Liu & H. Li*

Discrete element modeling of kinematics of void collapse in granular materials

*W.L. Lim & G. McDowell*

Implementation and three dimensional example applications of a bounding surface hypo-plasticity model for sand as a C++ UDM for *FLAC<sup>3D</sup>*

*F.G. Ma & Z.L. Wang*

## **Mining**

Initialization of non-uniform stress for complex geology and topographic conditions

*J.R. Killian, P.F. Cicchini & S.C. Schmelter*

Stresses under coal stockpiles during drawdown

*I.H. Clark*

Ore pass stability analysis at the Brunswick Mine using *PFC<sup>3D</sup>*

*K. Esmaili, J. Hadjigeorgiou & R. Harrison*

Calibration of large-scale three-dimensional non-linear numerical models of underground mines using microseismic data

*P.P. Andrieux, M.R. Hudyma, C.P. O'Connor, H. Li, L. Cotesta & R.K. Brummer*

Application of global-local modeling to mining rock mechanics problems

*J. Sjöberg & L. Malmgren*

The application of Itasca codes for cavability assessment in Longwall Top Coal Caving Technology

*A. Vakili, Y.J. Cai & B. Hebblewhite*

*3DEC* numerical modeling of the Tindaya Mountain Project

*M. Senís & P. Varona*

Numerical analysis of strata behavior in the vicinity of a longwall panel in a coal seam mined with roof caving

*M. Kwaśniewski*

Back-analysis of an inter-ramp scale failure in the south wall of the Rosario Pit – Cia. Minera Doña Inés de Collahuasi

*E.A. Santander, M.I. Riveros & I.T. Smoje*

## **Fabric**

Relating *PFC* parameters to rock properties for application to reservoir scale geomechanics

*H.T. Alassi & R.M. Holt*

Investigation of the air void effect on asphalt mixture using 2D and 3D DEM

*S. Adhikari, Z. You, Q. Dai & Y. Liu*

A grain scale *PFC*<sup>3D</sup> model

*L. Li, I. Larsen & R.M. Holt*

Strength parameters for granular soils governed by their grain-size properties

*T.N. Lohani, S. Kato, T. Sakakibara, S. Shibuya & Y. Yoshimura*

3D microstructural modeling

*M. Herbst, H. Konietzky & K. Walter*

A new method of microparameter determination for *PFC*<sup>2D</sup> synthetic rock model generation

*J. Yoon, S. Jeon, O. Stephansson, A. Zang & G. Dresen*

Role of interfacial strength properties in determining bulk mechanical properties in block-in-matrix rocks

*S.-H. Yoo & Y. Park*

Effects of grain shape on mechanical behaviors and shear band of granular materials in DEM analysis

*T. Sakakibara, S. Kato, S. Shibuya & J.G. Chae*

Modeling granular particle shape using discrete element method

*N. Das, B. Sukumaran & A.K. Ashmawy*

Evolution of shape fabrics in deforming rigid-object bearing systems: a distinct element method approach

*Y. Park, K.-S. Kim, C. Lee & Y. Park*

## **Underground Construction**

Engineering evaluation of design concepts for a large span urban underground station cavern in weak rock based on design analysis

*J.C. Sharp, S.C. Bandis, C.A. Schinas, R.N. MacKean & S.P. Watson*

Numerical analysis of tunnel Cenkova using *FLAC*<sup>3D</sup>

*J. Likar & J. Čadež*

Analysis of live loads on culverts using *FLAC*<sup>3D</sup>

*D.L. Petersen, G. Li & C.R. Nelson*

The application of *FLAC*<sup>3D</sup> on Picote II Underground Powerhouse

*C. Esteves, N. Plasencia & C. Lima*

Numerical modeling of a subway construction accident: case history and analysis

*B. Liu, T. Li & Y. Han*

Simulation of the excavation of a tunnel using an EPB machine

*M. Senís, P. Varona & P. Velasco*

Protection measures of monumental buildings during the excavation of a tunnel with an EPB machine

*M. Senís, P. Varona & P. Velasco*

Numerical 3D modeling of displacement grouting in shallow tunneling

*E. Schuller & G. Pittino*

Research on simulation of rupture of rock mass around tunnels based on *PFC*

*T. Wang, Q. Sheng, Y.H. Zhang & W. Qin*

## **Dynamic**

Analysis of a seismically induced highway embankment failure during the 2007 Noto earthquake

*P. Kitiyodom, A. Murata, Y. Sas, E. Shimamoto, T. Matsumoto & M. Kitaura*

Modeling and monitoring of hammer piling induced vibrations

*B. Ni, K. Carr, M. Thomas & P.J. Millar*

Wave propagation in cross-anisotropic soils with dynamic *FLAC*

*G. Inci & K. Rao*

Validity of the pseudostatic surface assumption for evaluating seismically-induced deformation in slopes

*P.M. Strenk & J. Wartman*

Seismic earth pressures on below-grade U-shape walls

*E. Zhai & B. O'Neill*

Modeling shock and detonation waves with *FLAC*

*P.A. Cundall & C. Detournay*

## **Retaining Wall**

Bulkhead wall design on very soft clay ground

*C. Dai*

Installation of a triple anchored excavation wall in sand using the Cysoil model

*C. Detournay & Y. Han*

A *FLAC* model for classical earth pressure problems

*J.S. Shiau, C.J. Thomas & C.A. Smith*

## **Foundation**

Differential settlements with *FLAC*<sup>3D</sup>

*G. Inci & J. Glastonbury*

Foundation located near slope ~ A *FLAC* study

*J.S. Shiau, J.F. Watson & C.A. Smith*

## ***Soil/Structure Interaction***

*FLAC* numerical simulation in settlement mitigation

*Y. Li & S. Anderson*

Simulation of randomly oriented coir fiber reinforced soil with *FLAC*<sup>3D</sup>

*S. Halder, A.K. Vasudevan & G.L. Sivakumar Babu*

Modeling of impacted geocellular structure dedicated to rockfall protection barriers by DEM analysis

*D. Bertrand, S. Lambert, F. Nicot & Ph. Gotteland*