

Conference Programme*

International Symposium on Discrete Element Modelling of Particulate Media

In celebration of the 70th Birthday of Colin Thornton



29-30th March 2012

School of Chemical Engineering, University of Birmingham, Birmingham UK

Welcome Reception will take place in the **Atrium** of Chemical Engineering Building
between 5:30-7:30 PM on Wednesday 28th March 2012

All podium presentations will take place in **Lecture Theatre LT124**, and poster display in the atrium

**The organising committee reserves the right to alter the programme if necessary*

Organising Committee

Ali Hassampour	University of Leeds & PTSG, UK
Ahmadian, Hossein	P&G, UK
Kenya Kuwagi	Okayama University of Science, Japan
Guoping Lian	Unilever, UK (Co-Chair)
Chunlei Pei	University of Birmingham, UK (Secretariat)
Qicheng Sun	Tsinghua University, China
Stefano Utili	University of Warwick, UK
Chuan-Yu Wu	University of Birmingham, UK (Chair)
Stefan Zigan	University of Greenwich & PTSG, UK

Scientific Committee

Mike Adams	<i>University of Birmingham, UK</i>
Paul Cleary	<i>CSIRO, Australia</i>
Jennifer Curtis	<i>University of Florida, USA</i>
Alberto Di Renzo	<i>Università degli studi della Calabria, Italy</i>
Mojtaba Ghadiri	<i>University of Leeds, UK</i>
Stefan Heinrich	<i>Hamburg University of Technology, Germany</i>
Minjing jiang	<i>Tongji University, China</i>
Shuiqing LI	<i>Tsinghua University, China</i>
Jinghai Li	<i>Chinese Academy of Sciences, China</i>
Shihai Li	<i>Institute of Mechanics, Chinese Academy of Sciences, China</i>
Stefan Luding	<i>University of Twente, Netherlands</i>
Ante Munjiza	<i>Queen Mary University of London, UK</i>
Raffaella Ocone	<i>Heriot Watt University, UK</i>
Jin Ooi	<i>University of Edinburgh, UK</i>
Catherine O'Sullivan	<i>Imperial College London, UK</i>
Thorsten Poeschel	<i>Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany</i>
Jean-noel Roux	<i>IFSTTAR, Marne-la-Vallée, France</i>
Agba Salman	<i>University of Sheffield, UK</i>
Jonathan Seville	<i>University of Surrey, UK</i>
Hugh Stitt	<i>Johnson Matthew, UK</i>
Toshitsugu Tanaka,	<i>Osaka University, Japan</i>
Antoinette Tordesillas	<i>The University of Melbourne, Australia</i>
Jürgen Tomas	<i>Otto-von-Guericke-University Magdebur, Germany</i>
Yutaka Tsuji	<i>Osaka University, Japan</i>
Berend van Wachem	<i>Imperial College London, UK</i>
Otis Walton	<i>Grainflow Dynamics, Inc. USA</i>
Richard Williams	<i>University of Birmingham, UK</i>
Aibing Yu	<i>University of New South Wales, Australia</i>

Symposium Programme

Overview

Wednesday 28th March 2012	
15:00-18:00	Registration (Foyer, Chemical Engineering Building)
17:30-19:30	Welcome reception (Atrium, Chemical Engineering Building)
Thursday 29th March 2012	
08:00-11:20	Registration
09:00-09:05	Introduction – Drs Charley Wu & Guoping Lian
09:05-09:15	Welcome Address – Prof. Richard Williams (PVC & Head of EPS)
09:15-09:40	Keynote presentation - DEM & Experiments: Who's Telling the Truth? Prof. Jonathan Seville (<i>University of Surrey, UK</i>)
09:40-10:05	Keynote presentation - Recent Developments in Discrete Element Modelling of Particulate Systems Prof. Aibing Yu (<i>University of New South Wales, Australia</i>)
10:05-10:50	Session I – Fluidisation
10:50-11:20	Coffee/Tea/Poster
11:20-11:45	Keynote Presentation- Applying Concepts and Findings from Discrete Element Analyses to Realistic Systems Dr. Catherine O'Sullivan (<i>Imperial College London, UK</i>)
11:45-12:10	Keynote Presentation- Quasi-static Deformation Prof. Jean-Noel Roux (<i>IFSTTAR, Marne-la-Vallée, France</i>)
12:10-13:10	Session II - Coupled DEM-CFD Modelling
13:10-14:00	Lunch/Poster
14:00-14:25	Keynote presentation - Application of DEM to Pedestrian Flow in Panic Prof. Yutaka Tsuji (<i>Professor emeritus of Osaka University & Hosokawa Powder Technology Foundation, Japan</i>)
14:25-15:55	Session III - Particulate Flow
15:55-17:10	Poster pitch session
17:10 -19:00	Posters with drinks
19:30-22:00	Symposium Dinner
Friday 30th March 2012	
09:00-09:25	Keynote presentation - Fluid Solvers for Mechanics of Discontinua Prof. Ante Munjiza (<i>Queen Mary University of London, UK</i>)
09:25-09:50	Keynote presentation - From Granular Dynamics to Continuum Mechanics Prof. Stefan Luding (<i>University of Twente, Netherlands</i>)
09:50-11:05	Session IV - Quasi-Static deformation
11:05-11:35	Coffee/Tea/Poster
11:35-12:00	Keynote presentation - Liquid Bridges Prof. Mike Adams (<i>University of Birmingham, UK</i>)
12:00-12:25	Keynote presentation - Agglomerate Breakage Prof. Mojtaba Ghadiri (<i>Institute of Particle Science and Engineering, University of Leeds, UK</i>)
12.25-13.10	Session V – Cohesive Particle Systems
13:10-14:00	Lunch/Poster
14:00-14:25	Keynote presentation - Is Discrete Element Modelling Useful? Prof. Agba Salman (<i>University of Sheffield, UK</i>)
14:25-15:40	Session VI - Liquid-Solid Systems
15:40-16:25	Session VII – Fragmentation & Electrification
16:25 -16:30	Closing Remarks & Departure

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10:05-10:50	Session I – Fluidisation
10:05-10:20	Dynamic Adhesion Force Model for DEM-CFD Coupling Simulation of Fluidized Behavior of Geldart's-Group-A Particles Toshitsugu Tanaka ¹ , Tomonari Kobayashi ² , Naoki Shimada ² , Toshihiro Kawaguchi ³ ¹ <i>Department of Mechanical Engineering, Osaka University</i> ² <i>Sumitomo Chemical Co., Ltd.</i> ³ <i>Department of Safety Science, Kansai University</i>
10:20-10:35	Multiscale Simulation of the Fluidized Bed Spray Granulation S. Heinrich , M. Dosta, S. Antonyuk <i>Institute of Solids Process Engineering and Particle Technology, Hamburg University of Technology, Denickestraße 15, 21073 Hamburg, Germany</i>
10:35-10:50	From Single Particle Drag Force to Segregation in Fluidized Beds Alberto Di Renzo , Francesco P. Di Maio Dipartimento di Ingegneria Chimica e dei Materiali, Università della Calabria, Via P. Bucci Cubo 44A, 87036 Rende (CS), Italy
10:50-11:20	Coffee/Tea/Poster
11:20-11:45	Keynote Presentation- Applying Concepts and Findings from Discrete Element Analyses to Realistic Systems Dr. Catherine O'Sullivan <i>Imperial College London, UK</i>
11:45-12:10	Keynote Presentation- Quasi-static Deformation Prof. Jean-Noel Roux <i>IFSTTAR, Marne-la-Vallée, France</i>

12:10-13:10	Session II - Coupled DEM-CFD Modelling
12:10-12:25	Fully-resolved Simulation of a Gas-fluidized Bed: a Critical Test of DEM Models S.H.L. Kriebitzsch, M.A. van der Hoef , J.A.M. Kuipers <i>Technical University of Eindhoven, The Netherlands</i>
12:25-12:40	Numerical Modelling of the Motion of Large Object in Fluidized Bed Takuya TSUJI , Kyohei HIGASHIDA, Yoshitomo OKUYAMA & Toshitsugu TANAKA <i>Department of Mechanical Engineering, Osaka University</i>
12:40-12:55	CFD-DEM Simulation and Direct Measurement of the Granular Flow in a Rotor Granulator J. Neuwirth ¹ , S. Antonyuk ¹ , S. Heinrich ¹ , M. Jacob ² ¹ <i>Institute of Solids Process Engineering and Particle Technology, Hamburg University of Technology, Hamburg, Germany</i> ² <i>Glatt Ingenieurtechnik GmbH, Weimar, Germany</i>
12:55-13:10	Micro Scale CFD – DEM Simulation with a New Capillary Force Model Kimiaki Washino ¹ , Hong S. Tan ² , Mike J. Hounslow ¹ and Agba D. Salman ¹ ¹ <i>Department of Chemical and Biological Engineering, University of Sheffield, Sheffield, S1 3JD, UK</i> ² <i>P&G Innovation Centres Ltd, Whitley Road, Longbenton, Newcastle upon Tyne, NE12 9TS, UK</i>
13:10-14:00	Lunch/Poster
14:00-14:25	Keynote presentation - Application of DEM to Pedestrian Flow in Panic Prof. Yutaka Tsuji <i>Professor emeritus of Osaka University & Hosokawa Powder Technology Foundation, Japan</i>
14:25-15:55	Session III - Particulate Flow
14:25-14:40	DEM Simulation of Migration Phenomena in Slow Dense Slurry Flow with Brownian Motion Effects M.A. Koenders and M. Ibrahim <i>Division of Civil, Chemical and Environmental Engineering, Surrey University, UK</i>
14:40-14:55	What Causes the Pressure Dip Underneath a Sandpile? Jun Ai ¹ , Jian-fei Chen ² and Jin Y. Ooi ² <i>1. Nottingham Centre for Geomechanics, University of Nottingham, U.K.</i> <i>2. Institute for Infrastructure & Environment, University of Edinburgh, U.K.</i>
14:55-15:10	Analysis of Particle Motion in a Paddle Mixer: a Comparison between DEM Simulation and PEPT Experiment Ali Hassanpour ¹ , Massih Pasha ¹ , Hossein Ahmadian ² , Hongsing Tan ³ , Andrew Bayly ³ and Mojtaba Ghadiri ¹ ¹ <i>Institute of Particle Science and Engineering, University of Leeds, Leeds, UK</i> ² <i>P&G Technical Centre Ltd., Newcastle Upon Tyne, UK</i> ³ <i>P&G, Beijing Innovation Centre, 35 Yu'an road, Shunyi district, Beijing. 101312. P.R. China</i>
15:10-15:25	Axial Dispersion within Rotating Cylinders J.R Third , G. Lu and C.R Müller <i>Department of Mechanical and Process Engineering, ETH Zürich, Switzerland</i>
15:25-15:40	DEM Simulations of Disc Inserts Immersed in Grain during Silo Filling and Discharge R. Kobyłka , M. Molenda <i>Institute of Agrophysics PAS, ul. Doswiadczalna 4, 20-290 Lublin, Poland.</i>
15.40-15.55	Modeling Packing of Spherical Fuel Elements in Pebble Bed Reactors Using DEM

	Heikki Suikkanen , Jouni Ritvanen, Payman Jalali, Riitta Kyrki-Rajamäki <i>Lappeenranta University of Technology, Lappeenranta, Finland</i>
15:55-17:10	Poster pitch session (3 min each with 1 slide only)
17:10 -19:00	Posters with drinks
19:30-21:30	Symposium Dinner

Friday 30th March 2012	
09:00-09:25	Keynote presentation - Fluid Solvers for Mechanics of Discontinua Prof. Ante Munjiza <i>Queen Mary University of London, UK</i>
09:25-09:50	Keynote presentation - From Granular Dynamics to Continuum Mechanics Prof. Stefan Luding <i>University of Twente, Netherlands</i>
09:50-11:05	Session IV – Quasi-static Deformation
09:50-10:05	Revisiting Localised Deformation in Sand with Complex Systems Antoinette Tordesillas ¹ , David M. Walker ¹ , Edward Andò ² and Gioacchino Viggiani ² ¹ <i>Department of Mathematics and Statistics, University of Melbourne, Australia</i> ² <i>Grenoble-INP, Laboratoire 3SR, Grenoble F-38041, France</i>
10:05-10:20	DEM Simulation of Ellipsoidal Particle Assemblages: Micromechanical Perspective Considering the Effect of Shape of Particles. Anitha Kumari S D, T G Sitharam <i>Department of Civil Engineering, Indian Institute of Science, India</i>
10:20-10:35	A Numerical Investigation of Quasi-Static Conditions for Granular Media C. Modenese ¹ , S. Utili ² , and G.T. Houlsby ¹ ¹ Department of Engineering Science, University of Oxford, UK ² School of Engineering, University of Warwick, Coventry, CV4 7AL, UK
10:35-10:50	Characteristics of Irreducible Cell Structure of 2D Granular Solid Takashi Matsushima ^{1,3} , Raphael Blumenfeld ^{2,3} ¹ <i>Department of Engineering Mechanics and Energy, University of Tsukuba, Japan</i> ² <i>Earth Science and Engineering, Imperial College London, London SW7 2AZ, UK</i> ³ <i>Cavendish Laboratory, Cambridge University, Cambridge CB3 0HE, UK</i>
10:50-11:05	Micromechanical Investigation of Methane Hydrate Soil Sediments using Discrete Element Method: Pore-Filling Hydrate Distribution Yanxin Yu ¹ , Yi Pik (Helen) Cheng ¹ and Kenichi Soga ² ¹ Civil, Environmental And Geomatic Engineering, University College London ² Geotechnical Research Group, Department of Engineering, University of Cambridge
11:05-11:35	Coffee/Tea/Poster
11:35-12:00	Keynote presentation - Liquid Bridges Michael J. Adams , [†] James Bowen, [†] David Cheneler, [‡] James W. Andrews, [†] Andrew R. Avery, [§] Zhibing Zhang, [†] and Michael C. L. Ward, [‡] [†] School of Chemical Engineering and [‡] School of Mechanical Engineering, The University of Birmingham, Edgbaston, Birmingham B15 2TT,

	United Kingdom §Unilever R&D Port Sunlight, Quarry Road East, Bebington, Wirral CH63 3JW, United Kingdom
12:00-12:25	Keynote presentation - Agglomerate Breakage Prof. Mojtaba Ghadiri <i>Institute of Particle Science and Engineering, University of Leeds, UK</i>
12.25-13.10	Session V – Cohesive Particle Systems
12:25-12:40	Discrete Element Modelling of Fine Particulates in Electrostatically-Coupled Flow Systems Shuiqing Li , Mengmeng Yang, Guanqing Liu and Qiang Yao Department of Thermal Engineering, Tsinghua University, Beijing, 100084, China
12:40-12:55	Nanoparticle Aggregate and Deposit Morphology Evolution: Coagulation, Fragmentation, Restructuring and Competing Transport Mechanisms Athanasios G. Konstandopoulos , Margaritis Kostoglou and Nicolas Vlachos <i>Aerosol & Particle Technology Laboratory, CPERI/CERTH, Themi 57001, Greece</i>
12:55-13:10	Modelling of The Contact Behaviour Between Fine Adhesive Particles Including Viscous Damping K. Mader , J. Tomas <i>Department of Process Engineering, Otto-von-Guericke-University Magdeburg</i>
13:10-14:00	Lunch/Poster
14:00-14:25	Keynote presentation - Is Discrete Element Modelling Useful? Prof. Agba Salman <i>University of Sheffield, UK</i>
14:25-15:40	Session VI – Liquid-solid systems
14:25-14:40	Lattice Boltzmann Modelling of Liquid-gas Phase Changes in a Granular Material Jean-Yves Delenne ¹ , Vincent Richefeu ² , Farhang Radjai ¹ , Fabien Soulié ¹ ¹ LMGC UMR 5508, University of Montpellier 2, France ² Laboratoire 3S-R, UMR5521, Université Joseph Fourier, INP, Grenoble Université, BP 53, 38041 Grenoble Cedex 9, France
14:40-14:55	Effect of Solid-Liquid Heat Conductivity Ratio on Two-Phase Flow Behaviours Shintaro TAKEUCHI , Takaaki TSUTSUMI and Takeo KAJISHIMA <i>Dept. of Mechanical Engineering, Osaka University, Japan</i>
14:55-15:10	Effect of the Pendular State on the Collapse of Granular Columns. Artori Riccardo ¹ , Gabrieli Fabio ² , Santomaso Andrea ¹ , Cola Simonetta ² ¹ Department of Chemical Engineering Principles and Practice (DIPIC) University of Padova, Via Marzolo 9, 35131 Padova, Italy ² Dept. of Hydraulic, Maritime, Environmental and Geotechnical Engineering University of Padova, via Ognissanti 39, 35129 Padova, Italy
15:10-15:25	Simulation of the Drying of Silver Ink Micro Droplets T. Breinlinger , A. Wonisch, T. Kraft Fraunhofer Institute for Mechanics of Materials IWM, Freiburg, Germany
15:25-15:40	Modelling of Drug Release from Swelling Polymer Tablets using Discrete Element Method J.A.KIMBER ¹ , F. ŠTĚPÁNEK ¹ , S.G.KAZARIAN ¹ ¹ Department of Chemical Engineering, Imperial College London, UK
15:40-16:30	Session VII – Fragmentation and Electrification
15:40-15:55	DEM Analysis on Grading Change Caused by Grain Crushing Takao UEDA , Takashi, MATSUSHIMA, Yasuo YAMADA <i>University of Tsukuba, Japan</i>
15:55-16:10	Discrete Element Modelling of the Fragmentation of Plastic Materials Ferenc Kun ¹ , Gábor Timár ¹ , Jan Blömer ² , and Hans J. Herrmann ³ ¹ Department of Theoretical Physics, University of Debrecen

	² Spezialwerkstoffe, Fraunhofer UMSICHT, Germany ³ Computational Physics IfB, HIF, ETH, Hönggerberg, 8093 Zürich, Switzerland
16:10 -16:25	DEM Modelling of Contact Electrification of Non-Spherical Particles Chunlei Pei ¹ , Chuan-Yu Wu ¹ , David England ² , Harold Berchtold ² and Mike Adams ¹ ¹ School of Chemical Engineering, University of Birmingham, B25 2TT, UK ² Sanofi-Aventis Deutschland GmbH, Frankfurt, Germany
16:25 – 16:30	Closing Remarks & Departure

A List of Posters

1. Fluidisation & DEM-CFD

A026	Discrete Particle Modelling for the Optimization of a Novel Prismatic Spouted Bed Apparatus V. Salikov ¹ , S. Antonyuk ¹ , S. Heinrich ¹ , V.S. Sutkar ² , N.G. Deen ² , J.A.M. Kuipers ² 1Institute of Solids Process Engineering and Particle Technology, Hamburg University of Technology, Denickestrasse 15, 21073 Hamburg, Germany 2Department of Chemical Engineering and Chemistry, Eindhoven University of Technology, P.O. Box 513, 5600 MB Eindhoven, The Netherlands
B028	Experimental Validation of Discrete Element Simulations DJ Holland* ¹ , TC Chandrasekera ¹ , M Pore ¹ , J Third ² , CR Müller ² , SA Scott ³ , JS Dennis ¹ 1. Department of Chemical Engineering and Biotechnology, University of Cambridge, Pembroke Street, Cambridge, CB2 3RA. 2. Laboratory of Energy Science and Engineering, ETH Zurich, Leonhardstrasse 27, 8092 Zurich, Switzerland. 3 Department of Engineering, University of Cambridge, Trumpington Street, Cambridge CB2 1PZ.
A027	DEM-CFD Study of Particle Dynamics during Aerogel Coating in a Spouted Bed Granulator Sergiy Antonyuk, Stefan Heinrich Institute of Solids Process Engineering and Particle Technology, Hamburg University of Technology, Denickestr. 15, 21073 Hamburg, Germany
B017	An Introduction to CFD for DEM Users Ed Wynn ¹ , Mohan Srinivasa ² , Ulrich Becker ³ and Markus Braun ³ 1 ANSYS UK Ltd, Sheffield Business Park, Sheffield S9 1XH, UK 2 ANSYS India, 34/1 Rajiv Gandhi Infotech Park, Pune 411057, India 3 ANSYS Germany GmbH, Birkenweg 14a, Darmstadt 64295, Germany
B008	DEM/CFD Modelling of Fluid-Particle Flows with Moving and Irregular Boundaries Chuan-Yu Wu, Yu Go and Colin Thornton School of Chemical Engineering, University of Birmingham, Birmingham, B15 2TT, UK
A031	Using DEM to Determine the Solid-solid Drag Force Between Particulate Phases Payman Jalali and Timo Hyppänen Department of Energy, Lappeenranta University of Technology, 53851, Lappeenranta, Finland
A019	Coupled DEM-CFD Simulations of the Spray Zone in a Fluidized Bed Agglomeration Process M. Heine ¹ , S. Antonyuk ¹ , S. Heinrich ¹ , D. Dopfer ² , S. Palzer ³ 1Institute of Solids Process Engineering and Particle Technology, Hamburg University of Technology, Hamburg, Germany; 2Nestlé Research Center, Lausanne, Switzerland; 3Nestlé Product Technology Center, York, Great Britain.
A023	Simulation of the Filtration Behaviour by Coupling DEM and CFD S. Stein ¹ , J. Tomas ²

	<p>1Process and Systems Engineering, Institute of Process Engineering, Chair Mechanical Process Engineering, Otto-von-Guericke-University Magdeburg, Germany</p> <p>2Process and Systems Engineering, Institute of Process Engineering, Chair Mechanical Process Engineering, Otto-von-Guericke-University Magdeburg, Germany</p>
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2. Particulate Flow

A013	<p>Experimental Investigations and Modelling of the Storage Time Distribution of Grains Flowing out of a Silo</p> <p>C. Cogné¹, M. Guessasma², J. Fortin, K. Saleh³</p> <p>1University Claude Bernard Lyon 1, LAGEP – UMR 5007, Villeurbanne-France.</p> <p>2University of Picardie Jules Verne, LTI – EA 3899, Saint Quentin, France.</p> <p>3Chemical Engineering dept. Compiègne University of Technology, TIMR – EA 4297. Compiègne-France</p>
A003	<p>Die Filling Optimization Using Three-dimensional Discrete Element Modeling</p> <p>Claas Bierwisch, Torsten Kraft, Hermann Riedel and Michael Moseler</p> <p>Fraunhofer-Institut für Werkstoffmechanik IWM, Wöhlerstraße 11, 79108 Freiburg, Germany</p>
A017	<p>Two Contact Models in Simulations of Outflow of Rapeseed from a Model Silo</p> <p>P. Parafiniuk, M. Molenda, J. Horabik</p> <p>Instytut Agrofizyki PAN, ul. Doświadczalna 4, 20-290 Lublin 27, Poland</p>
B007	<p>DEM Modelling of High Speed Die Filling Processes</p> <p>Chuan-Yu Wu, Frank Ogbuagu and Chunlei Pei</p> <p>School of Chemical Engineering, University of Birmingham, Birmingham, B15 2TT</p>
B009	<p>Assessing Flowability of Small Quantities of Cohesive Powder using Distinct Element Modelling</p> <p>Massih Pasha</p> <p>Institute of Particle Science & Engineering, University of Leeds, Leeds, UK</p>
A021	<p>DEM Model for the Digging Process of Gravel (Influence of Particle Roundness)</p> <p>Shinichiro MIYAI, Tetsuya KATSUO, Takuya TSUJI, Takemori TAKAYAMA, Toshitsugu TANAKA</p> <p>Department of Mechanical Engineering, Osaka University</p>
A037	<p>Study on the Behavior of the Active Layer and Particle Motion in Rotating Cylinders by DEM Simulation</p> <p>Zhiyin Xie, Junxiao Feng</p> <p><i>School of Mechanical Engineering, University of Science and Technology Beijing, 100083, Beijing, China.</i></p>
B027	<p>DEM modelling of subsidency of a solid particle in granular media</p> <p>Chey Hui Goey, Chunlei Pei and Chuan-Yu Wu</p> <p><i>School of Chemical Engineering, University of Birmingham, B25 2TT, UK</i></p>

3. Quasi-static deformation

A024	<p>Effects of Void Ratio and Water Content on Mechanical Behavior of Structural Loess in Oedometer Test by Discrete Element Method Analyses</p> <p>Hu Haijun^{1, 2}, Jiang Mingjing^{1, 2, 3}</p> <p>1Department of Geotechnical Engineering, Tongji University, Shanghai, 200092, China.</p> <p>2Key Laboratory of Geotechnical and Underground Engineering of Ministry of Education, Tongji University, Shanghai, 200092, China.</p> <p>3School of Highway, Chang'an University, Xi'an 710064, China.</p>
A001	<p>Study of Anisotropies Evolution in Direct Shear Test Using Discrete Element Method</p>

	Ali Asghar Mirghasemi, Morteza Naeij <i>School of Engineering, College of Engineering, University of Tehran, Tehran, Iran</i>
B019	Micromechanical Study on Shear Wave Velocity of Granular Materials using Discrete Element Method (DEM) Xiaomin Xu ^{1,2} , Daosheng Ling ¹ , Yi Pik Cheng ² and Yunmin Chen ¹ 1Key Laboratory of Soft Soils and Geoenvironmental Engineering of MOE, Zhejiang University, China 2Department of Civil, Environmental and Geomatic Engineering, University College London
A000	2D Numerical Simulation of Direct Shear Test Using Elliptical Particles Ali Asghar Mirghasemi, Morteza Naeij <i>School of Engineering, College of Engineering, University of Tehran, Tehran, Iran</i>
B021	3D DEM Simulations of Undrained Triaxial Behaviour with Preshearing History Guobin Gong ¹ , Colin Thornton ² and Andrew HC Chan ³ 1Civil and Environmental Engineering, Graduate School in Shenzhen, Harbin Institute of Technology, China. (formerly School of Civil Engineering, The University of Birmingham) 2School of Chemical Engineering, The University of Birmingham 3School of Civil Engineering, The University of Birmingham, United Kingdom
B020	Micromechanics of Seismic Wave Propagation in Granular Materials John O'Donovan, Catherine O'Sullivan, George Marketos Department of Civil and Environmental Engineering, Imperial College London, UK
B018	Numerical Simulations of Sandy Seabeds by DEM Triaxial Tests G. Macaro ¹ and S. Utili ² 1Department of Engineering Science, University of Oxford, UK 2School of Engineering, University of Warwick, UK, formerly at Department of Engineering Science, University of Oxford
B016	The Influence of Particle Shape on Shear Deformation Behaviour Colin Hare, Ali Hassanpour and Mojtaba Ghadiri Institute of Particle Science and Engineering, The University of Leeds, Leeds, LS2 9JT
B014	Strong Network of Gap-Graded Granular Mixtures under One Dimensional Compression N.H. Minh and Y.P. Cheng Department of Civil, Environmental and Geomatic Engineering University College London, Gower Street, WC1E 6BT, UK
A032	Energy and Temperatures for Multiscale Behaviors of Granular Materials Shixiong Song , Qicheng Sun and Feng Jin <i>State Key Laboratory for Hydrosience and Engineering, Tsinghua University, Beijing 100084</i>
B024	A Study of the Influence of Surface Energy on the Mechanical Properties of Lunar Soil by DEM C. Modenese ¹ , S. Utili ² , and G.T. Houlsby ¹ 1Department of Engineering Science, University of Oxford, Parks Road, OX1 3PJ, UK 2School of Engineering, University of Warwick, Coventry, CV4 7AL, UK
B012	Exploring the Controlling Parameters Affecting Specimens Generated in a Pluviator using DEM Liang Cui University of Surrey, UK
A036	Verification on the Double Slip and Rotation Rate Model for Elliptical Granular Flow by the Distinct Element Method Liqing, Li, Mingjing, Jiang, Zhifu Shen <i>Dept. of Geotechnical Engineering and Key Laboratory of Geotechnical and Underground Engineering of Ministry of Education, Tongji Univ., Shanghai 20092, China.</i>

B003	Insights into the Modelling of Cohesive Powders A. Patel and S. Zigan Mechanical Engineering, University of Greenwich, Chatham, ME4 4TB
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4. Liquid-solid Systems

B005	Granular flows in Fluid Krishna Kumar ¹ , Kenichi Soga ¹ and Jean-Yves Delenne ² 1Department of Engineering, University of Cambridge, Cambridge, CB2 1PZ, UK 2LMGC UMR 5508, University of Montpellier 2, PI E. Bataillon, Montpellier, 34095 Cedex 5, France
B004	A Parametric Study on Behaviours of a Soil Bed due to Pipe Leakage Using the Coupled DEM-LBM Technique X. Cui, J. Li, A. H. Chan, and D. Chapman School of Civil Engineering, University of Birmingham, Edgbaston, Birmingham, B15 2TT
A035	Numerical Modelling of Simultaneous Heat and Mass Transfers in Starchy Material Following Hydrothermal Processes Seyed Amir Bahrani ¹ , Jean-Yves Monteau ² , Zoulikha Maache-Rezzoug ¹ , Catherine Loisel ² and Sid-Ahmed Rezzoug ¹ 1LSIE, FRE-CNRS 3474. La Rochelle, La Rochelle, France 2GEPEA, UMR CNRS 6144, ONIRIS, Nantes, France
B026	Sedimentation and separation of particles in a liquid: A 3D numerical study Liuchao Qiu ^{1,2} and C.-Y. Wu ² ¹ Department of applied mechanics, China Agricultural University, Beijing, China ² School of Chemical Engineering, University of Birmingham, B25 2TT, UK

5. Fragmentation and Electrification

A007	On the Effect of Soil Modification by Lime Using Grading Entropy E. Imre ^{1, 2} , J. Szendefy ² , J. Lőrincz ¹ , P.Q. Trang ² and Vijay P. Singh ³ 1Szent Istvan University, Budapest, Hungary 2Budapest University of Technology and Economics, Budapest, Hungary 3Department of Biological and Agricultural Engineering & Department of Civil & Environmental Engineering, Texas A and M University, Texas 77843-2117, USA
B002	Numerical Simulation on the Collapse of Granular Column by the DEM T. Zhao ¹ , G.T. Houlsby ¹ and S. Utili ² 1 Department of Engineering Science, University of Oxford, United Kingdom 2 School of Engineering, University of Warwick, Coventry CV4 7AL, United Kingdom
A033	Tribo-Electric Charging of Particles in a Shaker Masayuki Imba ^{1,2} , Tatsushi Matsuyama ¹ and Mojtaba Ghadiri ² 1Department of Environmental Engineering for Symbiosis, Soka University, Japan 2Institute of Particle Science and Engineering, University of Leeds
B001	A New Contact Detection Algorithm between Convex Polygonal and Polyhedral Particles in the Discrete Element Method C.W. Boon ¹ , G.T. Houlsby ¹ and S. Utili ² 1Department of Engineering Science, University of Oxford, Oxford OX1 3PJ, United Kingdom 2School of Engineering, University of Warwick, Coventry CV4 7AL, United Kingdom
B010	Plastic Elastic Collision of Solid Spheres Bouncing in Air under Gravity I.Cavarretta ^{1*} , Erdin Ibraim ² and Catherine O'Sullivan ³ 1 Division of Civil, Chemical and Environmental Engineering, Faculty of Engineering and Physical Sciences, University of Surrey, Guildford, GU2 7XH 2 Department of Civil Engineering, University of Bristol, Bristol, BS8 1TR

