Computational Modelling '11

Monday 20th June

17.00-18.00   Registration, cheese and wine reception. Accompanying partners welcome.

Tuesday 21st June

08.00   Registration desk opens

09.00   Opening Remarks
B.A. Wills (MEI, UK) and S.J. Neethling (Imperial College, UK)

09.30   *Technical Session 1*
Chairmen: P. Jonsén (Luleå University of Technology, Sweden) and P. Dupuy (CSIRO Mathematics, Informatics and Statistics, Australia)

09.30   **A review of process flowsheeting in the mineral processing industries**
Z. Harber and C. Aldrich (University of Stellenbosch, South Africa)

09.50   **Modelling multi-phase through packed beds and heaps using Smooth Particle Hydrodynamics (SPH)**
S.J. Neethling (Imperial College, UK)

10.10   **DEM investigation of optimum sizes of grinding media in tumbling ball mills**
M.H. Wang, R.Y. Yang, A.B. Yu (University of New South Wales, Australia)

10.30   Coffee

11.20   **Discrete modelling of gas-solid flow and heat transfer in a three-dimensional sector model of blast furnace**
W.J. Yang, Z.Y. Zhou, A.B. Yu (University of New South Wales, Australia), D. Pinson and P. Zulli (BlueScope Steel Research, Australia)

11.40   **Development of particle flow simulator in charging process of blast furnace by discrete element method**
H. Mio, M.K. S. Matsuzaki and K. Kunitomo (Nippon Steel Corp., Japan)

12.00   **CFD modelling of pulverized coal injection in ironmaking blast furnace: effect of key operating conditions**
Y. Shen, A. Yu (University of New South Wales, Australia), and P. Zulli (BlueScope Steel Research, Australia)

12.20   **CFD-DEM study of the multiphase flow in a dense medium cyclone: the effect of fluctuation of solid flow**
K.W. Chu, A.B. Yu (University of New South Wales, Australia) and A. Vince (Elsa Consulting Company Pty Ltd, Australia)

12.40   Lunch

14.00   *Technical Session 2*
        Chairman: A.B. Yu (University of New South Wales, Australia)

14.00   **A comparison between deformable and rigid particle behaviour in FEMDEM simulations of angular fragment processing**
        J.-P. Latham and J. Xiang (Imperial College, UK)

14.20   **An immersed body method for modelling arbitrary shaped particles settling in a fluid: two-way coupling of FEMDEM solids with a multiphase adaptive mesh CFD code, Fluidity**
        J. Xiang, D. Pavlidis, J.-P. Latham, C. Pain, F. Milthaler, M. Piggott and A. Vire (Imperial College, UK)

14.40   **The advantages of using mesh adaptivity to model the drainage of liquid in froths**
        P.R. Brito-Parada, S.J. Neethling and J.J. Cilliers (Imperial College, UK)

15.00   **Effect of microwave treatment on mineral liberation through bonded particle modelling of simulation of single particle compression**
        A.Y.Ali and S.M. Bradshaw (University of Stellenbosch, South Africa)

15.20   Coffee

16.20   Optional Guided Coast Path Walk, ending with a beer at the Chain Locker Pub, Old Falmouth

Wednesday 22nd June

09.00   *Technical Session 3*
        Chairmen: L.A. Cisternas (Universidad de Antofagasta, Chile) and G. Morris (Imperial College, UK)

09.00   **Discrete element modelling for the simulation of particle distribution to a sensor-based sorter**
        R. Fitzpatrick, R.D. Pascoe and H.J. Glass (University of Exeter, UK)

09.20   **CFD simulation of a gravitational air classifier**
        R. Johansson and M. Evertsson (Chalmers University of Technology, Sweden)

09.40   **The effect of liner wear on gyratory crushing – a DEM case study**
        J. Quist, M. Evertsson (Chalmers University of Technology, Sweden) and J. Franke (Scanalyse Pty Ltd, Australia)

10.00   **A novel method for full-body modelling of grinding charges in tumbling mills**
        P. Jonsén, B.I. Pålsson and H.-Å. Häggblad (Luleå University of Technology, Sweden)

10.20   Coffee

11.10   **Commminution efficiency improvement, based on SAG mill mechanics, evaluated by discrete element method (DEM) w/ particle breakage**
        L. Nordell and A. Potapov (Conveyor Dynamics, Inc., USA)

11.30   **Empirical-based design of minerals handling and processing equipment: end of era?**
        J. Favier (DEM Solutions Ltd., U.K)

11.50 **Predicting bulk material flow and behaviour for design and operation of bulk material handling and processing plants**
P. Wypych, A. Grima (University of Wollongong, Australia), R. LaRoche (DEM Solutions, USA) and D. Curry (DEM Solutions, UK)

12.10 **Computer simulation of the direct reduction iron fabrication in Midrex ovens**
A.C Silva (Federal University of Goiás, Brazil) and A.T. Bernardes (Federal University of Ouro Preto, Brazil)

12.30 Lunch

14.00 *Technical Session 4*
Chairman: S.J. Neethling (Imperial College, UK)

14.00 **On the modelling of caliche minerals: phenomenological and analytical models–some comparisons**
E.D. Gálvez (Universidad Católica del Norte, Chile), L. Moreno (Royal Institute of Technology, Sweden), M.E. Mellado (CICITEM, Chile) and L.A. Cisternas (Universidad de Antofagasta, Chile)

14.20 **Heap leach multi-scale modelling**
P. Dupuy, K. Akama, P. Schwarz (CSIRO Mathematics, Informatics and Statistics, Australia) and M. Leahy (CSIRO Earth Science and Resource Engineering, Australia)

14.40 **Stochastic analysis of heap leaching process via analytical methods**
M.E. Mellado, E.D. Gálvez (Universidad Católica del Norte, Chile) and L.A. Cisternas (Universidad de Antofagasta, Chile)

15.00 **Employing CFD technology in the modeling of heap leach processes**
D. McBride, M. Cross (Swansea University, UK, and J.E. Gebhardt (Process Engineering Resources, Inc., USA

15.20 Closing Remarks
S.J. Neethling (Imperial College, UK) and A.J. Wills (MEI, UK)

15.30 Coffee

POSTERS

Cold climate application of bioheap leaching knowledge
R. Wakelin, N.P. Dang and A. Verhoef (Northern Research Institute Narvik, Norway)

Parameter estimation and modelling of heap leaching by using analytical models
M.E. Mellado, E.D. Gálvez (Universidad Católica del Norte, Chile) and L.A. Cisternas (Universidad de Antofagasta, Chile)

Design of flotation circuits under uncertainty
N.E. Jamett, L.A. Cisternas (Universidad de Antofagasta, Chile) and J.P. Vielma (University of Pittsburgh, USA)

Numerical study of blast furnace process under different burden patterns
S.B. Kuang, X.F. Dong and A.B. Yu (University of New South Wales, Australia)

Grinding mill simulation using Austin model
A.C Silva (Federal University of Goiás, Brazil) and J.A.M. Luz (Federal University of Ouro Preto, Brazil)

Dynamic modelling and simulation of gradual performance deterioration of a crushing circuit including time dependence and wear

G. Asbjörnsson, E. Hulthén and M. Evertsson (Chalmers University of Technology, Sweden)

A fractal approach for mineral breakage

A.C Silva (Federal University of Goiás, Brazil) and J.A.M. Luz (Federal University of Ouro Preto, Brazil)

Computer simulation of the granular material flow in silos

E.M.S. Silva, A.C. Silva and S.O. Freitas (Federal University of Goiás, Brazil)

Digital analysis of the granular media porosity

E.M.S. Silva, A.C. Silva, G.C.S. Silva, R.A. Souza, S.O. Freitas, F.K Silva and E.A. Silva (Federal University of Goiás, Brazil)

Simulating particles in thin films and at interfaces

G. Morris, S.J. Neethling and J.J. Cilliers (Imperial College, UK)

Effect of grinding media size distribution on wet grinding

C. T. Jayasundara, R.Y. Yang and A.B. Yu (University of New South Wales, Australia)

CFD modelling and analysis of the combustion of ternary coal blends

Y. Shen, T. Shiozawa, A. Yu (University of New South Wales, Australia) and P. Austin (BlueScope Steel Research, Australia)

Structural analysis of a rotating mill with the finite element method

F. Berglund (Luleå University of Technology, Sweden)