

Comminution '18



[#Comminution18](#)

Provisional Timetable- changes will be highlighted and alerted on the [conference website](#)

Sunday April 15th

17.00-18.30 Registration and wine reception, with hot and cold canapés (accompanying persons welcome)

Monday April 16th

07.15 Registration desk opens. Light breakfast of filled croissants, tea, coffee and fruit juice

08.20 Opening Remarks
B.A. Wills (MEI, UK)

08.40 *Technical Session I*
Chairmen: TBA

08.40 **Introducing variable electricity cost into the Comminution Energy Curves**
G. Ballantyne (JKMRC, Australia)

09.00 **Which uncertainties do we need to model in simulation based comminution to perform statistical learning**
D.N. Wilke (University of Pretoria, South Africa), N. Govender (University of Johannesburg, South Africa, and University of Surrey, UK), R. Rajamani (University of Utah, USA) and P. Pizette (IMT Lille Douai, France)

09.20 **Integration of a liberation model in a simulation framework for comminution circuits**
E.M. Pérez-García, J. Bouchard and É. Poulin (Université Laval, Canada)

09.40 **Effects of bed dimensions on fine particle breakage**
D. Altun and H. Benzer and O. Altun (Hacettepe University, Turkey)

10.00 **The simulation of crack propagation in particles using DEM**
T. Oladele, L. Bbosa (University of Cape Town, South Africa) and D. Weatherley (JKMRC, Australia)

10.20 Coffee, exhibition and poster viewing

11.10 **Developing a mechanistic mill model**
M.S. Powell (JKMRC, Australia)

11.30 **Quantifying variability of ore breakage by impact**
F. Faramarzi, V. Jokovic, R. Morrison and S.S. Kanchibotla (JKMRC, Australia)

11.50 **Use of multi-component ore characteristics to model and simulate flexible processing circuits**
B. Foggianto (JKMRC and Ausenco Ltd, Australia), M.M. Hilden and M. Powell (JKMRC, Australia)

- 12.10 **Application of multi-disciplinary optimization architecture in mineral processing simulation**
K. Bhadani, G. Asbjörnsson, E. Hulthén, M. Bengtsson and M. Evertsson (Chalmers University of Technology, Sweden)
- 12.30 **Analysis of dynamic process characteristics in concentration plants from robustness point of view**
M. Johansson, G. Asbjörnsson and M. Evertsson (Chalmers University of Technology, Sweden)
- 12.50 Lunch
- 14.00 *Technical Session 2*
Chairmen TBA
- 14.00 **Validating DEM simulations using high-speed videos of crack propagation in granite**
M. Klichowicz, T. Frühwirt and H. Lieberwirth (TU Bergakademie Freiberg, Germany)
- 14.20 **Important factors affecting the gauging abrasion resistance of materials**
J. Jiang and Y. Xie (National Research Council, Canada) and R. Hall (University of Alberta, Canada)
- 14.40 **How far the crushing performance can be pushed? Cone crusher vs Vertical Shaft Impactor (VSI)**
H.R. Manouchehri (Sandvik SRP AB, Sweden, Adjunct Professor, University of British Columbia, Canada)
- 15.00 **VeRo Liberator® high-velocity impact comminution for improved size-reduction, particle liberation, and energy consumption in mineral processing**
G. Borg (PMS GmbH, Germany), O. Scharfe and F. Scharfe (Martin Luther University Halle-Wittenberg, Germany)
- 15.20 Coffee
- 16.00 **Simple method to predict cone crushers' performance**
J. Eliasson (Sandvik Mining and Rock Technology, Sweden) and H.R. Manouchehri (Sandvik SRP AB, Sweden, Adjunct Professor, University of British Columbia, Canada)
- 16.20 **Cone crusher operating diagnostics using high sampling rates of power draw**
A. Gröndahl, G. Asbjörnsson, J. Quist, E. Hulthén and M. Evertsson (Chalmers University of Technology, Sweden)
- 16.40 **Validation of product size distribution and throughput predicted by DEM for a cone crusher**
R.D. Morrison (JKMRC, Australia), G.W. Delaney, P.W. Cleary, M.D. Sinnott and S. Cummins (CSIRO Data 61, Australia)
- 17.00- Sundowner in Vineyard gardens
18.00 Accompanying guests welcome

Tuesday April 17th

- 08.00 Registration desk opens. Light breakfast of filled croissants, tea, coffee and fruit juice
- 08.50 *Technical Session 3*
Chairmen TBA
- 08.50 **Keynote Lecture: Comminution in 2068 - will SAG mills still be relevant?**
H. Lieberwirth (TU Bergakademie Freiberg, Germany)
- 09.20 **A time dynamic model of the High Pressure Grinding Rolls crusher**
M. Johansson, J. Quist and M. Evertsson (Chalmers University of Technology, Sweden)
- 09.40 **HPGR roller life extension with dynamic load sharing**
M. Perrucci, M. Pischtschan and S. Belz (ABB Switzerland Ltd., Switzerland)
- 10.00 **Prediction of the pilot HPGR product size distribution by using population balance model**
B. Sönmez (Metso Process Optimisation Solutions, Turkey), H. Benzer, H. Dündar (Hacettepe University, Turkey) and S.-L. Watson (Metso Process Optimisation Solutions, Australia)
- 10.20 Coffee
- 11.10 **Axial pressure distribution within a HPGR investigation using DEM**
P.W. Cleary and M.D. Sinnott (CSIRO Data61, Australia)
- 11.30 **Optimization of the SAG mill-Pebble crusher circuit by controlling crusher operational parameters**
H. Li (FLSmidth A/S, Denmark), M. Evertsson (Chalmers University, Sweden), M. Lindqvist (FLSmidth A/S, Denmark), E. Hulthen and G. Asbjörnsson (Chalmers University, Sweden)

- 11.50 **Results from installing turbo pulp lifter (TPL) in Ahafo SAG mill**
E. Asakpo (Newmont, Ghana), A. Heath and S Chaffer (Outotec, Australia)
- 12.10 **SAG mill optimisation using power-based simulations**
R. Chandramohan, R. Braun, G. Lane, E. Wang and B. Foggiatto (Ausenco Services Pty Ltd, Australia)
- 12.30 **Real time “virtual sensors” to assess internal SAG mill conditions**
M. de Geus, G. Kopec, C. Gonzalez, B. Wolter and H. McNamara (IntelliSense.io, UK)
- 12.50 Lunch
- 14.00 *Technical Session 4*
Chairmen: TBA
- 14.00 **Quantifying the benefit of an online particle size analyser in an AG mill circuit**
C.W. Steyn (Anglo American Platinum, South Africa) and R.P. Brown (Stone Three Mining, South Africa)
- 14.20 **Designing the future: using advanced technologies to create a step change in mill relining safety and performance**
P. Rubie and J. Russell (Russell Mineral Equipment, Australia)
- 14.40 **A model of SAG mill power and its application to real-time mill performance analysis**
M.M. Hilden and M.S. Powell (JKMRC, Australia)
- 15.00 **Operating cost improvements at a Canadian gold mine due to conversion to single stage SAG milling**
J. Starkey and S. Reeves (Starkey & Associates Inc., Canada)
- 15.20 **Prediction of slurry grinding due to media and coarse rock interactions in a 3D pilot SAG mill using a coupled DEM-SPH model**
P.W. Cleary (CSIRO Data61, Australia), R.D. Morrison (JKMRC, Australia) and M.D. Sinnott (CSIRO Data61, Australia)
- 15.40 **Guide for setting up an autogenous mill for linear, dynamic optimization with advanced process control**
C.W. Steyn (Anglo American Platinum, South Africa) and A. Mainza (University of Cape Town, South Africa)
- 16.00 Coffee
- 17.45 Coaches leave for conference dinner at Lagoon Beach

Wednesday April 18th

- 07.00 Registration desk opens. Light breakfast of filled croissants, tea, coffee and fruit juice
- 08.00 *Technical Session 5*
- 08.00 **Keynote Lecture: Superior comminution circuit performance: integrating classification during design is the key**
A. Mainza (University of Cape Town, South Africa)
- 08.30 **The influence of the water balance and classifier choice on the energy efficiency of milling circuits**
A. Hinde (Independent Consultant, South Africa), E. Ford (Mintek, South Africa) and J. Makola (Derrick Solutions International, South Africa)
- 08.50 **Measuring and tracking cyclone overflow particle size in real-time at each individual cyclone is now possible**
J. Felix (Felix Project Management and Consulting Services, South Africa), D. Cirulis, R. Maron, C. O’Keefe and J. Medina (CiDRA Minerals Processing, USA)
- 09.10 **Selective air classification and separation system for efficient operation in wide particle size ranges**
J. Kolacz (Comex AS, Norway)
- 09.30 **An analysis of classification innovations in closed circuit ball mills**
M.P. Hay (Eurus Mineral Consultants, South Africa)
- 09.50 **A study of energy dissipation in tumbling mills using data from Positron Emission Particle Tracking measurements**
M. Richter, I. Govender, A.N. Mainza (University of Cape Town, South Africa), I. Parker and K. Richardson (De Beers Marine, South Africa)
- 10.10 Coffee
- 10.50 **Addition of pebbles to a ball-mill to improve grinding efficiency - Part 2**
S. Nkwanyana, B. Loveday and I. Govender (University of KwaZulu-Natal, South Africa)

- 11.10 **Development of comminution test method for small ore samples**
H. Heiskari (University of Oulu, Finland), P. Kurki (Outotec Oy, Finland), S. Luukkanen, M. Sinche Gonzales (Oulu Mining School, Finland), H. Lehto and J. Liipo (Outotec Oy, Finland)
- 11.30 **Validation of a full-body model of a tumbling mill including the physical interactions between pulp, charge and mill structure**
P. Jonsén, G. Lindkvist, B.I. Pålsson and S. Hammarberg (Luleå University of Technology, Sweden)
- 11.50 **Advances and validation of mechanistic model of batch ball milling**
V. Rodriguez, R.M. de Carvalho and L.M. Tavares (Universidade Federal do Rio de Janeiro, Brazil)
- 12.10 **Development of a laboratory test for regrinding ball mill or stirred mill circuits**
J. Tian (CITIC SMCC Process Technology Pty Ltd, Australia), J. Yang (CITIC HIC Laboratories, China) and S. Morrell (SMC Testing Pty Ltd, Australia)
- 12.30 **DEM-CFD two-way coupled modelling of tumbling mills - effect of slurry viscosity on charge motion and energy spectra**
K. Mayank, V.T. Reddy, M. Narasimha (IIT Hyderabad, India), I. Govender (University of Kwazulu-Natal, South Africa) and A.N. Mainza (University of Cape Town, South Africa)
- 12.50 Lunch
- 14.00 *Technical Session 6*
Chairmen: TBA
- 14.00 **Stirred media mill-classifier-circuit for dry fine grinding – effect of operating parameters and grinding aids**
P. Prziwara, S. Breitung-Faes, A. Kwade (Technische Universität Braunschweig, Germany)
- 14.20 **Improving IsaMill energy efficiency through shaft spacer design**
G. Anderson (Glencore Technology, Australia)
- 14.40 **Optimizing the grinding of dolomite in the IsaMill**
D. Schons, S. Breitung-Faes and A. Kwade (Technical University Braunschweig, Germany)
- 15.00 **A case study of fine grinding optimization scaling up from lab test to industrial production**
J. King, A. Wang, R. Xu, J. Zhou and N. Li (King's Ceramics & Chemicals Co. Ltd, China)
- 15.20 Coffee
- 16.00 **Tower Mill circuit performance in the magnetite grinding circuit – the multi-component approach**
S. Palaniandy (Nippon Eirich Co. Ltd, Australia), R. Halomoan (Karara Mining Limited, Australia) and H. Ishikawa (Nippon Eirich Co. Ltd, Japan)
- 16.20 **Using two-way coupled DEM-SPH to model an industrial scale Stirred Media Detritor**
C.B Ndimande, A.N. Mainza, I. Govender (University of Cape Town, South Africa), P.W. Cleary and M.D. Sinnott (CSIRO Data61, Australia)
- 16.40 **Vortex stability in stirred media detritors; measurement and grind efficiency**
T. Norejko, K. van der Wielen, K. Hadler and N. Wilshaw (Grinding Solutions Ltd, UK)
- 17.00- Sundowner in exhibition and poster area
18.00 Accompanying guests welcome

Thursday April 19th

- 08.15 Registration desk opens. Light breakfast of filled croissants, tea, coffee and fruit juice
- 09.00 *Technical Session 7*
Chairmen: TBA
- 09.00 **The Ro-Star ultra-fine grinding mill – theoretical, technical and practical development**
M. Battersby, S. Flatman, R. Imhof, H. Sprenger (Maelgwyn Mineral Services Ltd, UK), K. Großmann and Urs Peuker (Technische Universität Bergakademie Freiberg, Germany)
- 09.20 **Energy efficient rotor design for HIGmills**
V. Keikkala, H. Lehto (Outotec Oy, Finland), A. Paz (Outotec, Australia) and T. Komminaho (Boliden Kevitsa Mining Oy, Finland)
- 09.40 **Comparing Vertical Roller Mill performance on two different precious metal ores**
D. Altun, H. Benzer (Hacettepe University, Turkey), W. Little, A. Mainza, M. Becker (University of Cape Town, South Africa) and C. Gerold (Loesche GmbH, Germany)

- 10.00 **Ore sorting for more efficient comminution and its impact on flotation performance**
C.J Greet, J. Kinal and G. Small (Magotteaux Australia Pty Limited, Australia)
- 10.20 Coffee
- 11.00 **Discrete element simulation of grinding mills with polyhedral shaped particles on the GPU**
N. Govender (University of Johannesburg, South Africa, and University of Surrey, UK), R. Rajamani (University of Utah, USA), D. Wilke (University of Pretoria, South Africa) and C. Wu (University of Surrey, UK)
- 11.20 **The impact of operating with screens or cyclones at Minera Saucito on comminution energy efficiency and mineral liberation**
J.J Frausto, G.R. Ballantyne, K. Runge, M.S. Powell (JKMTC, Australia), A. Nuñez, R. Cruz, H. Estrada and S. Gomez (Fresnillo PLC, Mexico)
- 11.40 **Commissioning the new Cullinan Diamond Mine processing plant**
G. van Wyk (ThyssenKrupp Industrial Solutions, South Africa), L. Jacobs and C. Swart (Petra Diamonds, South Africa)
- 12.00 **Multi-shaft mill case study on Kimberlite ore**
R.J. Bracey, M.S. Powell (JKMRC, Australia), B. Friedland (Energy and Densification Systems, South Africa)
- 12.20 **A comparison of comminution routes for a low-grade iron ore on the basis of eco-efficiency and costs**
J. Segura (Universidade Federal do Rio de Janeiro – COPPE/UFRJ, Brazil), N. Souza (COPPE/UFRJ and BHP, Brazil) and L.M. Tavares (COPPE/UFRJ, Brazil)
- 12.40 **The development of cumulative rates models for South African gold and platinum ores**
A. Hinde (Independent Consultant, South Africa)
- 13.00 Lunch
- 14.00 *Technical Session 8*
Chairmen: TBA
- 14.00 **Grinding aid evaluation at Cormidom copper mine**
K. Bakeev, A. DiMaio, A. Shepherd (Solenis, USA), F. Ramirez, V. Lugo-Gonzalez (Solenis, Dominican Republic), J.R. Lizardo, C.V. Umipig, Jr, F.A.C. Mamani and M.H. Lopez (Cormidom, Dominican Republic)
- 14.20 **The effect of Vertical-Roller-Mill comminution on the processing of a Peruvian copper ore**
C. Schmitz (Loesche GmbH, Germany)
- 14.40 **First application of a Vertical-Roller-Mill in a sulfide copper-gold ore project**
H. Benzer (Hacettepe University, Turkey) and C. Gerold (Loesche GmbH, Germany)
- 15.00 **A study into the merit of optimised milling configuration on process performance – a case study of the mixed ore circuit at Kansanshi**
C. Chongo (First Quantum Minerals, Zambia), P.A. Bepswa and A.N. Mainza (University of Cape Town, South Africa)
- 15.20 **Comparing the results of a simulated crushing circuit solution to the site implemented solution**
C.W. Steyn, R.J. Fouchee (Anglo American Platinum, South Africa) and H. Kemp (Mogalakwena North Concentrator, South Africa)
- 15.40 Conference summary
A.N. Mainza (University of Cape Town, South Africa)
- 15.55 Closing Remarks and Invitation to Comminution '20
A.J. Wills (MEI, UK)
- 16.00 Farewell wine function, Vineyard Gardens
Accompanying guests welcome

POSTERS

Attrition of fired iron ore pellets by impact

P.P. Cavalcanti, R.M. de Carvalho and L.M. Tavares (Universidade Federal do Rio de Janeiro, Brazil)

The effect of different material on screening media

A.Davoodi, M. Bengtsson, E. Hultén and C.M Evertsson (Chalmers University of Technology, Sweden)

Use of a mineral texture and liberation model to estimate grade and recovery for coarse preconcentration

M.M. Hilden, B. Foggatto and G. Ballantyne (JKMRC, Australia)

SAG and HPGR comparative testing aimed at selection of optimal process for Udokan copper plant of 45 mtpa throughput

A.Y. Senchenko and Y.V. Kulikov (LLC "TOMS Science-Research and Design Institute", Russia)

The effect of non-spherical grinding media on Vertimill™

J.F.L.Silva, L.C.R. Machado, E.F. Castro, L.R. Fonseca (Minas Rio Project, Anglo American, Brazil), D.B. Mazzinghy (UFMG, Brazil), R.A. Silva (Minas Rio Project, Brazil) and A.F. Silveira (Minas Rio Project, Brazil)

A mathematical model describing the energy consumption in comminution and its application

Shuming Wen, Jian Liu, Jiushuai Deng (Kunming University of Science and Technology, China) and Xiaou Xia (Beijing General Research Institute of Mining & Metallurgy, China)

Comparing ore hardness parameters of UG2 ores using the JKRBT

C. Chikochi, L. Bbosa and A. Mainza (University of Cape Town, South Africa)

Prediction of the screw wear liner in vertical stirred mills by the discrete element method

D.B. Mazzinghy, D.T. Faioli, K.H. Andrade and F.S. Ribeiro (Universidade Federal de Minas Gerais, Brazil)

Predictive modelling of Vertimill™ liner wear using vibration signature analysis

P.M. Esteves, D.B. Mazzinghy, R. Galéry, B.C. Filho (Universidade Federal de Minas Gerais, Brazil), J.F.L.Silva and J.F.C. Russo (Anglo American - Minério de Ferro Brasil, Brazil)

Fundamental study assessing the influence of different modes of selective liberation on metallurgical performance

K. van der Wielen, K. Hadler and N. Wilshaw (Grinding Solutions Ltd, UK)

Optimizing grind of closed dry grinding and classification circuit treating iron ore fines suitable for pellet grade with the aid of simulations

N.P. Virendra, M. Narasimha (IIT Hyderabad, India), K.B. Venatesh and D. Srinivas (Tata Steel R7D, India)

Enhanced grade engineering

R.D. Morrison (JKMRC/SMI, Australia) and B.J. Adair (CRC Ore, Australia)

Study of high voltage pulse selective breakage using synthetic particles

W. Huang and F. Shi (JKMRC, Australia)

Breakage mechanism and its importance in mineral liberation in tungsten ores

L. Guldris, M. Bengtsson and M. Evertsson (Chalmers University of Technology, Sweden)

Determining the Bond ball mill work index with fewer cycles

D. Garcia (University of Queensland, Australia), G. Ballantyne (JKMRC, Australia) and H. Liang (JKTech Pty Ltd, Australia)

On line balls level measurement

W. Churata (Minera San Cristobal, Bolivia)

The impacts of fine grinding around different streams of cement grinding circuit

O. Altun, S. Zencirci and N.A. Toprak (Hacettepe University, Turkey)

Vertical-Roller-Mill for pyroxenite hard rock application

M. Stapelmann (Loesche GmbH, Germany)

Case study investigation of why forged grinding media outperformed high chrome in a MBWT

R. Bose, M. Bovell (Donhad Pty Ltd, Australia) and M. Manichia (Prometheus Developments Pty Ltd, Australia)

Comminution process modelling from a sustainability perspective

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

Plant utilization improvement at Newmont Ghana Gold Limited, Ahafo process operations

E. Asakpo (Newmont Ghana Gold Limited, Ghana)

Prediction of the product size distribution of a laboratory vertical stirred mill

D.C. Rocha, E. Spiller, P. Taylor and H. Miller (Colorado School of Mines, USA)

Rubber liners in the service of large diameter ball mill at Hudbay, Constancia Mine, Peru

R. Rajamani (University of Utah, USA), P. Kumar, N. Govender (University of Johannesburg, South Africa) and M. Medina (Hudbay Minerals, Constancia Mine, Peru)