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The 14th International Conference on Fluidization
– From Fundamentals to Products

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Conference Program

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Program

Fluidization XIV From Fundamentals to Products

May 26-31, 2013

*NH Conference Center Leeuwenhorst
Noordwijkerhout, The Netherlands*

Conference Co-Chairs

J.A.M. Kuipers

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Sunday, May 26, 2013

16:00 – 18:00	Conference Registration
16:30 – 17:30	Organizing Committee Meeting
18:00 – 19:00	Welcome Reception
19:00 – 20:30	Opening Remarks & Dinner
20:30 – 21:30	Chairperson Meeting

Monday, May 27, 2013

07:00 – 08:30	Breakfast – Location TBA	
	PLENARY SESSION 1 Chair: Hamid Arastoopour, Illinois Institute of Technology	
08:15 – 08:30	Opening announcements Hans Kuipers, Eindhoven University of Technology	
08:30 – 09:30	P-1: Coarse-grained models for momentum, energy and species transport in gas-particle flows Sankaran Sundaresan, Princeton University	
09:30 – 10:00	COFFEE BREAK	
	SESSION 1: Mixing and Segregation	SESSION 2: Chemical Looping
	Chair: Ted Knowlton, PSRI	Chair: Yi Cheng, Tsinghua University
10:00 – 10:30	K-1 Key Note: Solids back-mixing in CFB-furnaces Filip Johnsson, Chalmers University of Technology	K-2 Key Note: Operation of a coupled fluidized bed system for chemical looping combustion of solid fuels with a synthetic cu-based oxygen carrier Ernst-Ulrich Hartge, Hamburg University of Technology
10:30 – 10:45	1-1: Three dimensional computational modeling of particulate solids segregation and elutriation in a commercial scale fluidized bed classifier Kamal Adham, Hatch Ltd.	2-1: CO₂ capture by CaO in a sound assisted fluidized bed at Ca-looping conditions Jose Manuel Valverde, University of Seville
10:45 – 11:00	1-2: CFD simulation of binary fluidized mixtures: Effects of restitution coefficient and spatial discretization methods Carla Tagliaferri, University College London	2-2: Hydrogen generation from coal using novel chemical looping process with CuO and CaO as solid carrier Qingjie Guo, Qingdao University of Science and Technology

11:00 – 11:15	<p>1-3: Hydrodynamic characterization of "gulf stream" circulation in a pilot scale fluidized bed combustor</p> <p>Roberto Solimene, Consiglio Nazionale delle Ricerche/Istituto di Ricerche sulla Combustione</p>	<p>2-3: Simulating chemical looping combustion of solid fuels with a synthetic Cu-based oxygen carrier</p> <p>Joachim Werther, Hamburg University of Technology</p>
11:15 – 11:30	<p>1-4: Theoretical and numerical issues concerning DQMOM when simulating polydisperse fluidized powders</p> <p>Luca Mazzei, University College London</p>	<p>2-4: A novel reactor concept for hydrogen production with CO₂ capture: Membrane assisted chemical looping reforming</p> <p>José Antonio Medrano Jimenez, Eindhoven University of Technology</p>
11:30 – 11:45	<p>1-5: Estimation of the circulation time in a large-scale fluidized bed using DBM simulation data</p> <p>Javier Sánchez-Prieto, Universidad Carlos III de Madrid</p>	<p>2-5: Bed Sherwood Number and Chemical Kinetic Coefficient in a Fuel Reactor of Chemical Looping Combustion by Eulerian CFD Modeling</p> <p>Srujal Shah, Lappeenranta University of Technology</p>
11:45 – 12:00	<p>1-6: Segregation patterns in gas-fluidized beds</p> <p>Mark Gilbertson, University of Bristol</p>	<p>2-6: Fluidized bed calcium looping cycles for CO₂ capture: A comparison between dolomite and limestone</p> <p>Fabrizio Scala, Istituto di Ricerche sulla Combustione - CNR</p>
12:00 – 12:15	<p>1-7: Particle mixing and segregation in gas-solid fluidized beds containing polydisperse mixtures</p> <p>Olasaju Oloafe, Eindhoven University of Technology</p>	<p>2-7: Reactivating the CO₂ capture capacity of exhausted Ca-based sorbent particles for fluidized bed calcium looping application (double looping)</p> <p>Fabio Montagnaro, University of Naples</p>
12:15 – 12:30	<p>1-8: Experimental verification of the particle segregation model predictions for fluidized biomass/inert mixtures</p> <p>Alberto Di Renzo, University of Calabria</p>	

12:30 – 14:00	LUNCH & FREE TIME	
	SESSION 3: Micro-Scale Modeling	SESSION 4: Liquid Injection
	<u>Chair:</u> Raffaella Ocone, Heriot-Watt University	<u>Chairs</u> Abdelghafour Zaabout, SINTEF
14:00 – 14:30	K3 Keynote: Clustering instabilities in gas-solid systems: Role of dissipative collisions vs. viscous losses Peter Mitrano, Colorado School of Mines	K4 Keynote: Liquid injection into fluidized beds Ray A. Cocco, Particulate Solid Research, Inc.
14:30 – 14:45	3-1: Drag force model for DEM-CFD simulation of binary or polydisperse bubbling fluidized beds Alberto Di Renzo, University of Calabria	4-1: The effects of liquid properties and bed hydrodynamics on the distribution of liquid on solid fluidized particles in a cold-model fluidized bed Maryam Mohagheghi, ICFAR/Western University
14:45 – 15:00	3-2: Coupled LBM-DEM simulations of gas fluidized beds Christoph Müller, ETH Zürich	4-2: Bogging detection in the fluidized bed using planar capacitance sensors Majid Hamidi, ICFAR/Western University
15:00 – 15:15	3-3: DNS of the convective heat transfer in a fluidized bed with non-spherical particle Elias A.J.F.Peters, Eindhoven University of Technology	4-3: Agglomerate behavior in a recirculating fluidized bed with sheds: Effect of agglomerate properties Francisco Sanchez, ICFAR/Western University
15:15 – 15:30	3-4: Study on relationship between powder flow characteristics and lateral force acting on two contacting particles Azri Alias, Okayama University of Science	4-4: Evaluation of agglomerate stability in an industrial scale fluidized bed using conductivity method Nicholas Prociw, ICFAR/Western University
15:30 – 15:45	3-5: Effect of electrostatic forces on the axial and radial diffusivity of solid particles Reza Zarghami, University of Tehran	4-5: Review of methods to measure the contact between injection liquids and fluidized solids Francisco Sanchez, ICFAR/Western University
15:45 – 16:00	3-6: Use of computational modeling for	4-6: Development of an experimental cold

	FCC reactor cyclone erosion reduction at the Marathon Petroleum Catlettsburg Refinery Scott Thibault, CPFD Software LLC	model for the fluid coking process Carolina Morales, ICFAR/Western University
16:00 – 16:15	3-7: Verification of sub-grid drag modifications for dense gas-particle flows in bubbling fluidized beds Simon Schneiderbauer, Johannes Kepler University	4-7: Simultaneous particle agglomeration and attrition in a fluidized bed reactor Tarek Jamaledine, ICFAR/Western University
16:15 – 16:45	COFFEE BREAK	
16:45 – 19:00	INDIVIDUAL MEETING & DISCUSSION	
19:00 – 21:00	DINNER	
21:00 – 23:00	POSTER SESSION 1 & SOCIAL HOUR (ORAL SESSION 1, 2, 3 & 4 PAPERS)	
PM 1	Solids back-mixing in CFB-furnaces Filip Johnsson, Chalmers University of Technology	
PM 3	Three dimensional computational modelling of particulate solids segregation and elutriation in a commercial scale fluidized bed classifier Kamal Adham, Hatch Ltd	
PM 5	CFD simulation of binary fluidized mixtures: Effects of restitution coefficient and spatial discretization methods Carla Tagliaferri, University College London	
PM 7	Hydrodynamic characterization of "gulf stream" circulation in a pilot scale fluidized bed combustor Roberto Solimene, Consiglio Nazionale delle Ricerche/Istituto di Ricerche sulla Combustione	
PM 9	Theoretical and numerical issues concerning DQMOM when simulating polydisperse fluidized powders Luca Mazzei, University College London	
PM 11	Estimation of the circulation time in a large-scale fluidized bed using DBM simulation data Javier Sánchez-Prieto, Universidad Carlos III de Madrid	
PM 13	Segregation patterns in gas-fluidised beds Mark Gilbertson, University of Bristol	
PM 15	Particle mixing and segregation in gas-solid fluidized beds containing polydisperse mixtures Olasaju Olaofe, Eindhoven University of Technology	
PM 17	Experimental verification of the particle segregation model predictions for fluidized biomass/inert mixtures Alberto Di Renzo, University of Calabria	

PM 19 (poster only)	A novel technology to segregate binary mixtures of different density in a conical spouted bed Maria J. San Jose, University of the Basque Country
PM 21 (poster only)	Modelling the transition to the fluidized state of two-solid beds: Mixtures of particles of irregular shape Brunello Formisani, Università della Calabria
PM 23 (poster only)	Takeover velocity in a gas-solid fluidized bed with binary solids Dong Hyun Lee, Sungkyunkwan University
PM 25 (poster only)	A new approach to analyse the influence of biomass devolatilisation on the segregation in a bubbling fluidised bed for gasification Benjamin Cluet, LEMTA
PM 27	Operation of a coupled fluidized bed system for chemical looping combustion of solid fuels with a synthetic Cu-based oxygen carrier Joachim Werther, Hamburg University of Technology
PM 29	CO2 capture performance of a CaO/nano-silica composite at Ca-looping conditions in a fluidized bed Jose Manuel Valverde, University of Seville
PM 31	Hydrogen generation from coal using novel chemical looping process with CuO and CaO as solid carrier Qingjie Guo, Qingdao University of science and technology
PM 33	Bed Sherwood Number and Chemical Kinetic Coefficient in a Fuel Reactor of Chemical Looping Combustion by Eulerian CFD Modeling Srujal Shah, Lappeenranta University of Technology
PM 35	Fluidized bed calcium looping cycles for CO2 capture: A comparison between dolomite and limestone Fabrizio Scala, Istituto di Ricerche sulla Combustione - CNR
PM 37	Reactivating the CO2 capture capacity of exhausted Ca-based sorbent particles for fluidized bed calcium looping application (double looping) Fabio Montagnaro, University of Naples
PM 39	Simulating chemical looping combustion of solid fuels with a synthetic Cu-based oxygen carrier Ernst-Ulrich Hartge, Hamburg University of Technology
PM 41 (poster only)	A novel configuration of the fuel reactor for chemical-looping combustion with oxygen uncoupling (CLOU) of solid fuels Antonio Coppola, Università degli Studi di Napoli Federico II
PM 43	Clustering instabilities in gas-solid systems: Role of dissipative collisions vs. viscous losses Peter Mitrano, Colorado School of Mines
PM 45	Coupled LBM-DEM simulations of gas fluidised beds Christoph Müller, ETH Zürich
PM 47	DNS of the convective heat transfer in a fluidized bed with non-spherical particle Elias A.J.F.Peters, Eindhoven University of Technology
PM 49	Effect of electrostatic forces on the axial and radial diffusivity of solid particles Reza Zarghami, University of Tehran

PM 51	Drag force model for DEM-CFD simulation of binary or polydisperse bubbling fluidized beds Alberto Di Renzo, University of Calabria
PM 53	Study on relationship between powder flow characteristics and lateral force acting on two contacting particles Azri Alias, Okayama University of Science
PM 55	Use of computational modeling for FCC reactor cyclone erosion reduction at the marathon petroleum catlettsburg refinery Scott Thibault, CPFD Software LLC
PM 57 (poster only)	Lagrangian simulation of bubbling dynamics in a lab-scale 2D fluidized bed Antonio Busciglio, Università degli Studi di Palermo
PM 59 (poster only)	Lattice boltzmann simulation of gas-solid fluidized bed containing non-spherical particles Christoph Müller, ETH Zürich
PM 61	Liquid injection into fluidized beds Ray A. Cocco, Particulate Solid Research, Inc.
PM 63	The effects of liquid properties and bed hydrodynamics on the distribution of liquid on solid fluidized particles in a cold-model fluidized bed Maryam Mohagheghi, ICFAR/Western University
PM 65	Bogging detection in the fluidized bed using planar capacitance sensors Majid Hamidi, ICFAR/Western University
PM 67	Agglomerate behavior in a recirculating fluidized bed with sheds: Effect of agglomerate properties Francisco Sanchez, ICFAR/Western University
PM 69	Evaluation of agglomerate stability in an industrial scale fluidized bed using conductivity method Nicholas Prociw, ICFAR/Western University
PM 71	Review of methods to measure the contact between injection liquids and fluidized solids Francisco Sanchez, ICFAR/Western University
PM 73	Development of an experimental cold model for the fluid coking process Carolina Morales, ICFAR/Western University
PM 75	Simultaneous particle agglomeration and attrition in a fluidized bed reactor Tarek Jamaledine, ICFAR/Western University
PM 77	Verification of sub-grid drag modifications for dense gas-particle flows in bubbling fluidized beds Simon Schneiderbauer, Johannes Kepler University

Tuesday, May 28, 2013

07:00 – 08:30	Breakfast	
	PLENARY SESSION 2 Chair: Joachim Werther, Hamburg University of Technology	
08:30 – 09:30	P-2: Fluidization of amorphous granules - Practical challenges, product structures and progress in modeling Prof. Heinrich (TU Hamburg) and Prof. Palzer	
09:30 – 10:00	COFFEE BREAK	
	SESSION 5: Discrete Element Modeling	SESSION 6: Novel Fluidized-Bed Reactors
	Chair: Sankaran Sundaresan, Princeton University	Chair: Mike Wormsbecker, Syncrude
10:00 – 10:30	K5 Keynote: A DEM study of the reduction of volumetric flow in bubbling fluidized bed methanation reactors Mao Ye, Dalian Institute of Chemical Physics	K6A Keynote: Two-zone fluidized bed reactor (TZFBR) as a potential tool for process intensification in catalytic reactions Miguel Menendez, University of Zaragoza
10:30 – 10:45	5-1: Hydrodynamic study of spout fluidized bed with draft plates by experimental and numerical investigations Vinayak Sutkar, Eindhoven University of Technology	6-1: Behavior of magnetofluidized beds as affected by particle size and field orientation Jose Manuel Valverde, University of Seville
10:45 – 11:00	5-2: The Formation and Interaction of Jets: A Magnetic Resonance Imaging Study Christoph Müller, ETH Zürich	6-2: Design of a statistical strategy to the control of a fluidized bed equipped with a rotating distributor Jesús Gómez-Hernández, Carlos III University of Madrid
11:00 – 11:15	5-3: The similarity for CFD-DEM simulation of fluidized bed and its numerical and experimental validation Zhihong Liu, IHI Corporation	6-3: Design criteria for a packed-fluidized bed: Homogeneous fluidization of Geldart's class B solids Rossella Girimonte, University of Calabria

11:15 – 11:30	5-4: Coarse-grid simulations using parcels: an advanced drag model based on filtered CFD-DEM data Stefan Radl, Graz University of Technology	6-4: Effects of diameter, baffles and operating conditions on pressure fluctuations in fluidized beds Allan Issangya, PSRI
11:30 – 11:45	5-5: Euler-Euler and Euler-Lagrangian evaluation of a pseudo-2D gas fluidized bed: An estimation of the wall boundary condition from DEM Fernando Hernández-Jiménez, Carlos III University of Madrid	K6B Keynote: Development of a novel concept of solar receiver/thermal energy storage system based on compartmented dense gas fluidized beds Piero Salatino, Università di Napoli Federico II
1:45 – 12:00	5-6: Space-time distribution analysis of biomass in a gasification dense fluidized bed reactor. Claudia Cadile, IUSTI	
12:00 – 12:15	5-7: Integration of high level CFD process simulation for development of fluidized bed biomass gasification Martin Weng, aixprocess GmbH	6-5: Development and application of an innovative dry bed ash extraction system for fluidized bed combustion boilers Lorenzo Lepore, Magaldi
12:15 – 12:30	5-8: Influence of viscous forces on the particle dynamics and agglomeration in fluidized beds Sergiy Antonyuk, Hamburg University of Technology	6-6: Packed fluidization and nuclear fusion technology D. Mandal, Bhabha Atomic Research Centre
12:30 – 12:45	5-9: Discrete particle modeling of a novel prismatic spouted bed reactor Sergiy Antonyuk, Hamburg University of Technology	
12:45 – 19:00	Lunch & Excursion / Workshop	
19:00 – 19:15	Group photo	
19:15 – 21:00	BANQUET	

21:00 – 23:00	POSTER SESSION 2 & SOCIAL HOUR (ORAL SESSION 5 & 6 PAPERS and FREE POSTER FORUM)
PM 2	A DEM study of the reduction of volumetric flow in bubbling fluidized bed methanation reactors Yuli Zhang, Southeast University
PM 4	The similarity for CFD-DEM simulation of fluidized bed and its numerical and experimental validation Zhihong Liu, IHI Corporation
PM 6	Hydrodynamic study of spout fluidized bed with draft plates by experimental and numerical investigations Vinayak Sutkar, Eindhoven University of Technology
PM 8	Coarse-grid simulations using parcels: An advanced drag model based on filtered CFD-DEM data Stefan Radl, Graz University of Technology
PM 10	Euler-Euler and Euler-Lagrangian evaluation of a pseudo-2D gas fluidized bed: An estimation of the wall boundary condition from DEM Fernando Hernández-Jiménez, Carlos III University of Madrid
PM 12	Space-time distribution analysis of biomass in a gasification dense fluidized bed reactor Claudia Cadile, IUSTI
PM 14	Integration of high level CFD process simulation for development of fluidized bed biomass gasification Martin Weng, aixprocess GmbH
PM 16	Discrete particle modeling of a novel prismatic spouted bed reactor Sergiy Antonyuk, Hamburg University of Technology
PM 18 (poster only)	Numerical studies of the dynamics of gas-fluidized beds comprised of non-spherical particles using the DEM-CFD Christoph Müller, ETH Zürich
PM 20	Influence of viscous forces on the particle dynamics and agglomeration in fluidized beds Sergiy Antonyuk, Hamburg University of Technology
PM 22	The formation and interaction of jets: A magnetic resonance imaging study Christoph Müller, ETH Zürich
PM 24	Development of a novel concept of solar receiver/thermal energy storage system based on compartmented dense gas fluidized beds Piero Salatino, Università di Napoli Federico II
PM 26	Two-zone fluidized bed reactor (TZFBR) as a potential tool for process intensification in catalytic reactions Miguel Menendez, University of Zaragoza
PM 28	Behavior of magnetofluidized beds as affected by particle size and field orientation Jose Manuel Valverde, University of Seville

PM 30	Design of a statistical strategy to the control of a fluidized bed equipped with a rotating distributor Jesús Gómez-Hernández, Carlos III University of Madrid
PM 32	Design criteria for a packed-fluidized bed: Homogeneous fluidization of Geldart's Class B solids Rossella Girimonte, University of Calabria
PM 34	Effects of diameter, baffles and operating conditions on pressure fluctuations in fluidized beds Allan Issangya, PSRI
PM 36	Development and application of an innovative dry bed ash extraction system for fluidized bed combustion boilers Lorenzo Lepore, Magaldi Power S.p.A.
PM 38 (poster only)	Development of a new concept of fluidized bed solar receiver: Experimental and 3D numerical study Benjamin Boissière, UMR 5503, Laboratoire de Génie Chimique
PM 40 (poster only)	Dual fluidized bed steam gasification of coal and pyrolyzed coal Stefan Kern, Vienna University of Technology

Wednesday, May 29, 2013

07:00 – 08:30	Breakfast	
	PLENARY SESSION 3 Chair: TBA	
08:30 – 09:30	P-3: Integrating Plasma Physics & Chemistry with Multiphase Flows in Fluidization Engineering Prof. Yi Cheng, Tsinghua University	
09:30 – 10:00	COFFEE BREAK	
	SESSION 7: Large-Scale Simulation and Modeling 1	SESSION 8: Measurement and Instrumentation 1
	Chair: Hamid Arastoopour, IIT	Chair: Daniel Lepek, The Cooper Union
10:00 – 10:30	K7 Keynote: Simulation of a high-density circulating fluidized bed riser with EMMS-based two-fluid model Junwu Wang, Chinese Academy of Sciences	K8 Keynote: Pressure signals in a gas-solid fluidized bed with thermally induced interparticle forces Jamal Chaouki, Ecole Polytechnique de Montreal
10:30 – 10:45	7-1: Characterization of the bubble behavior in vibrated fluidized beds by means of two-fluid CFD simulations coupled with accelerometry data Eduardo Cano-Pleite, Carlos III University of Madrid	8-1: Object motion in the freeboard of a bubbling fluidized bed Luis Miguel Garcia-Gutierrez, Carlos III University of Madrid
10:45 – 11:00	7-2: Theoretical investigation of the behavior of cohesive homogeneous gas-fluidized beds Oyebanjo Oke, University College London	8-2: Recurrence quantification analysis: A simple method to characterization of various structures in gas-solid fluidized beds Reza Zarghami, University of Tehran
11:00 – 11:15	7-3: Simulation of gas-solid turbulent fluidized bed hydrodynamic Salma Benzarti, National Engineering School of Monastir	8-3: Forces on horizontal tubes of non-circular cross-section in fluidized beds Yusumi Nagahashi, Kochi National College of Technology

11:15 – 11:30	<p>7-4: Numerical study of gas-solid fluidized beds: Analysis of pressure fluctuations for detection of disturbed fluidization Philipp Wiedemann, Brandenburg University of Technology Cottbus</p>	<p>8-4: Attractor comparison of vibration signal to characterize of hydrodynamics of fluidized beds Reza Zarghami, University of Tehran</p>
11:30 – 11:45	<p>7-5: A structure-dependent multi-fluid model for heterogeneous gas-solid flows Wei Wang, Chinese Academy of Sciences</p>	<p>8-5: Linking of the pressure oscillation in a pseudo two-dimensional bed with the spatiotemporal distribution of particles Fernando Hernández-Jiménez, Carlos III University of Madrid</p>
11:45 – 12:00	<p>7-6: An assessment of the ability of the TFM approach to predict gas mixing in a pseudo-2D bubbling fluidized bed Abdelghafour Zaabout, Sintef Materials and Chemistry / TUE Eindhoven</p>	<p>8-6: Numerical analysis of the dynamics in gas-solid fluidized beds and experimental validation using X-ray tomography Vikrant Vikrant, Eindhoven University of Technology</p>
12:00 – 12:15	<p>7-7: Numerical and experimental study of the agglomeration in a lab scale fluidized bed Manuel Heine, Hamburg University of Technology</p>	<p>8-7: Investigating flow structures of the bubbling-, turbulent- and fast-fluidization regime using fast X-ray tomography Jean Saayman, University of Pretoria</p>
12:15 – 12:30		<p>8-8: Development of a fluidized bed TGA Jamal Chaouki, Polytechnique Montreal</p>

12:30 – 14:00	LUNCH & FREE TIME	
	SESSION 9: Large-Scale Simulation and Modeling 2	SESSION 10: Measurement and Instrumentation 2 - Honouring John Yates
	Chair: Martin van Sint Annaland, Eindhoven University of Technology	Chairs: Ray Cocco, PSRI & Paola Lettieri, UCL
14:00 – 14:30	K9 Keynote: 3D numerical simulation of circulating fluidized bed: Comparison between theoretical results and experimental measurements of hydrodynamic Renaud Ansart, LGC-INPT	K10 Keynote: Non-intrusive online detection of ferromagnetic particles for measurement of bed density and residence time distribution in circulating fluidized bed systems Diana Carolina Guío Pérez, Vienna University of Technology
14:30 – 14:45	9-1: Scale-up of bubbling fluidized beds using CFD simulations Hamid Arastoopour, IIT	10-1: Magnetic resonance studies of deadzones in gas-solid fluidized beds Daniel Holland, University of Cambridge
14:45 – 15:00	9-2: Time-averaged simulation of the furnace of a commercial CFB boiler Juho Peltola, VTT Technical Research Centre of Finland	10-2: Development of a high temperature endoscopic-laser PIV/DIA technique for the study of the hydrodynamics of gas-solid fluidized beds Ildefonso Campos Velarde, Eindhoven University of Technology
15:00 – 15:15	9-3: Detailed macroscopic flowsheet simulation of fluidized bed granulation process based on microscale models Sergiy Antonyuk, Hamburg University of Technology	10-3: Characterizing electrostatic charges in high-pressure gas-solid fluidized beds: Experimental design and preliminary results Fawzi Salama, University of Ottawa
15:15 – 15:30	9-4: Development of a modeling tool representing biomass gasification in a dual fluidised bed unit Halima Noubli, CEA	10-4: Scale-up of fluidized bed reactors with vertical internals: a new approach accounting for chemistry and hydrodynamics Simon Maurer, Paul Scherrer Institut
15:30 – 15:45	9-5: An analysis method for fluidized bed flow behavior using electric circuit analogy Masanori Ishizuka, The University of Tokyo	10-5: Micro fluidized bed reaction analysis and its applications Xi Zeng, Chinese Academy of Sciences

16:00 – 19:30	INDIVIDUAL MEETING & DISCUSSION
19:30 – 21:00	DINNER
21:00 – 23:00	POSTER SESSION 2 & SOCIAL HOUR (ORAL SESSION 7, 8, 9 & 10 PAPERS)
PM 79 (poster only)	An EMMS-based two-fluid model for heterogeneous gas-solid riser flows: Type-A EMMS model vs Type-B EMMS model Junwu Wang, Chinese Academy of Sciences
PM 81	Characterization of the bubble behavior in vibrated fluidized beds by means of two-fluid CFD simulations coupled with accelerometry data Eduardo Cano-Pleite, Carlos III University of Madrid
PM 83	Theoretical investigation of the behavior of cohesive homogeneous gas-fluidized beds Oyebanjo Oke, University College London
PM 85	Simulation of gas-solid turbulent fluidized bed hydrodynamic Salma Benzarti, National Engineering School of Monastir
PM 87	Numerical study of gas-solid fluidized beds: Analysis of pressure fluctuations for detection of disturbed fluidization Philipp Wiedemann, Brandenburg University of Technology Cottbus
PM 89	A structure-dependent multi-fluid model for heterogeneous gas-solid flows Wei Wang, Chinese Academy of Sciences
PM 91	An assessment of the ability of the TFM approach to predict gas mixing in a pseudo-2D bubbling fluidized bed Abdelghafour Zaabout, Sintef Materials and Chemistry / TUE Eindhoven
PM 93	Numerical and experimental study of the agglomeration in a lab scale fluidized bed Manuel Heine, Hamburg University of Technology
PM 95 (poster only)	Study of flow behavior in bubbling fluidize bed biomass gasification reactor with CFD simulation Rajan Kumar Thapa, Telemark University College
PM 97 (poster only)	Two-fluid (Euler-Euler) numerical simulation of wall-to-bed heat transfer coefficients in a vertically vibrated gas-fluidized bed Antonio Acosta-Iborra, Carlos III University of Madrid
PM 99 (poster only)	Numerical investigation of the hydrodynamics of cylindrical fluidized bed Aditya Karnik, CD-adapco
PM 101 (poster only)	Time-averaged modeling of BFBS: Analysis of the terms in the momentum equations Sirpa Kallio, VTT Technical Research Centre of Finland

PM 103 (poster only)	Numerical modeling of gas-solids flow in large scale circulating fluidized bed using subgrid-scale model Srujal Shah, Lappeenranta University of Technology
PM 105 (poster only)	High performance computing (HPC) with neptune_CFD for the fluidization of particle-laden reactive flows Hervé Neau, Université de Toulouse / CNRS
PM 107	Pressure signals in a gas-solid fluidized bed with thermally induced interparticle forces Jaber Shabani, Ecole Polytechnique de Montreal
PM 109	Object motion in the freeboard of a bubbling fluidized bed Luis Miguel Garcia-Gutierrez, Carlos III University of Madrid
PM 111	Recurrence quantification analysis: A simple method to characterization of various structures in gas-solid fluidized beds Reza Zarghami, University of Tehran
PM 113	Forces on horizontal tubes of non-circular cross-section in fluidized beds Yusumi Nagahashi, Kochi National College of Technology
PM 115	Attractor comparison of vibration signal to characterize of hydrodynamics of fluidized beds Reza Zarghami, University of Tehran
PM 117	Numerical analysis of the dynamics in gas-solid fluidized beds and experimental validation using X-ray tomography Vikrant Verma, Eindhoven University of Technology
PM 119	Investigating flow structures of the bubbling-, turbulent- and fast fluidization regime using fast X-ray tomography Jean Saayman, University of Pretoria
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PM 123	Development of a fluidized bed TGA Jamal Chaouki, Polytechnique Montreal
PM 125 (poster only)	New generation X-ray imaging for multiphase systems Paola Lettieri, University College London
PM 127 (poster only)	Mechanical impact power erosion evaluation of fluidized bed reactor: Oil shale particle case Bouhafid Abdelmounaim, Université Cadi Ayyad
PM 129 (poster only)	Comparison of four different methods for measuring the solids circulation rate in circulating fluidized beds Florian Dietrich, Vienna University of Technology
PM 131 (poster only)	Analysis of the particle movement in dense granular flow Stefan Heinrich, Hamburg University of Technology
PM 133 (poster only)	Pressure drop correlation for the design of open-sided draft tube conical spouted beds Gartzen Lopez, University of the Basque Country

PM 135 (poster only)	Effect of irregular particles immersed in a bed of sand on the fluidization characteristics of the bed inventory Jamal Chaouki, Ecole Polytechnique de Montreal
PM 137 (poster only)	Identification of bed zones and flow regimes in single and multiple spout-operated beds by digital image processing and pressure probes Simon Schneiderbauer, Johannes Kepler University
PM 139	3D numerical simulation of circulating fluidized bed: Comparison between theoretical results and experimental measurements of hydrodynamic Renaud Ansart, LGC-INPT
PM 141 (poster only)	Scale-up of the bubbling fluidized beds using CFD simulations Hamid Arastoopour, IIT
PM 143	Time-averaged simulation of the furnace of a commercial CFB boiler Juho Peltola, VTT Technical Research Centre of Finland
PM 145	Detailed macroscopic flowsheet simulation of fluidized bed granulation process based on microscale models Sergiy Antonyuk, Hamburg University of Technology
PM 147	Development of a modeling tool representing biomass gasification in a dual fluidised bed unit Halima Noubli, CEA
PM 149	An analysis method for fluidized bed flow behavior using electric circuit analogy Masanori Ishizuka, The University of Tokyo
PM 151	Non-intrusive online detection of ferromagnetic particles for measurement of bed density and residence time distribution in circulating fluidized bed systems Diana Carolina Guío Pérez, Vienna University of Technology
PM 153	Magnetic resonance studies of deadzones in gas-solid fluidised beds Daniel Holland, University of Cambridge
PM 155	Development of a high temperature endoscopic-laser PIV/DIA technique for the study of the hydrodynamics of gas-solid fluidized beds Ildelfonso Campos Velarde, Eindhoven University of Technology
PM 157	Scale-up of fluidized bed reactors with vertical internals: A new approach accounting for chemistry and hydrodynamics Simon Maurer, Paul Scherrer Institut
PM 159	Characterizing electrostatic charges in high-pressure gas-solid fluidized beds: Experimental design and preliminary results Fawzi Salama, University of Ottawa-Chemical & Biological Engineering Department
PM 161	Micro fluidized bed reaction analysis and its applications Xi Zeng, Chinese Academy of Sciences

Thursday, May 30, 2013

07:00 – 08:30	Breakfast	
	PLENARY SESSION 4 Chair: John Grace, University of British Columbia	
08:30 – 09:30	P-4: Fluidization of fine powders: Cohesive versus dynamic aggregation Jose Manuel Valverde (Universidad de Sevilla)	
09:30 – 10:00	COFFEE BREAK	
	SESSION 11: Nano and Fine Particles	SESSION 12: Circulating Beds and Fast Fluidization
	Chair: Jamal Chaouki, Ecole Polytechnique De Montreal	Chair: Ernst-Ulrich Hartge, Hamburg University of Technology
10:00 – 10:30	K11 Keynote: Estimating the size of polar and apolar nanoparticle agglomerates in a fluidized bed Lilian de Martín, Delft University of Technology	K12 Keynote: Non-Hg catalyst and fluidized-bed process: from lab-scale to industrial pilot trial for Chinese green PVC industry Guohua Luo, Tsinghua University
10:30 – 10:45	11-1: Fluidization assistance of nanopowders by an alternating nonuniform electric field Jose Manuel Valverde, University of Seville	12-1: A new method to intensify heat transfer capacity of an FCC catalyst cooler: Experimental validation Yongmin Zhang, China University of Petroleum
10:45 – 11:00	11-2: Fluidization of nanoparticles: The effect of surface characteristics J. Ruud van Ommen, Delft University of Technology	12-2: Particle clusters properties in Gas–Solid Downer Units Angel Lanza, University of Western Ontario
11:00 – 11:15	11-3: Microscopic characterization of mechanically assisted fluidized beds David Valdesueiro, Delft University of Technology	12-3: The impact of a flue gas recirculation on temperature distribution and solids concentration inside a large-scale supercritical CFB boiler Artur Blaszczyk, Czestochowa University of Technology

11:15 – 11:30	11-4: Experimental measurements and links between gas-fluidization and flow properties of fine lactose powders Clive Davies, Massey University	12-4: Comparison of the gas and solids phase RTDS in a CFB downer reactor Martin R.J. Huard, ICFAR, Western University
11:30 – 11:45	11-5: Agitated fluidization of nanopowders using mechanical stirring Daniel Lepek, The Cooper Union	12-5: Flow development in the inlet section of a riser Maria N. Pantzali, Ghent University
11:45 – 12:00	11-6: Fluidization and mixing of nanoparticle agglomerates assisted via magnetic impaction James Scicolone Rutgers University	12-6: Analysis of length scales of solids volume fraction variations in a circulating fluidized bed of Geldart group B particles Debanga Mondal, Åbo Akademi University

12:30 – 14:30	LUNCH & FREE TIME	
	SESSION 13: Heat and Mass Transfer	SESSION 14: Reactor Performance
	<u>Chair:</u> Lilian de Martin, Delft University of Technology	<u>Chair:</u> Poupak Mehrani, University of Ottawa
14:30 – 15:00	K13 Keynote: Experimental studies of phase change materials in a bubbling fluidized bed Maria Izquierdo, Carlos III University of Madrid	K14 Keynote: Gas bypass and solids circulation rate of an i-CFB reactor with coarse particles Xiaotao Tony Bi, University of British Columbia
15:00 – 15:15	13-1: Analysis of lateral fuel mixing in a fluid dynamically down-scaled bubbling fluidized bed Erik Sette, Chalmers University of Technology	14-1: Carbonization characteristics of biomass/coal blend for bio-coke Myung Won Seo, Korea Institute of Energy Research
15:15 – 15:30	13-2: CO₂ capture on fine activated carbon under sound assisted fluidization conditions Paola Ammendola, IRC-CNR	14-2: The gas flow in the loop seals of a dual circulating fluidized bed: Splitting of the fluidizing agent and gas leakage through the loop seals Karl Mayer, Vienna University of Technology

15:30 – 15:45	13-3: Simulation of fuel mixing in fluidized beds using a combined tracking technique David Pallarès, Chalmers University of Technology	14-3: A kinetic study of methanol to OLEFINS (MTO) process in fluidized bed reactor Lei Ying, Zhejiang University
15:45 – 16:00	13-4: Development of a novel non-invasive IR technique for concentration measurements in gas-solid fluidized beds: Application to bubble-to-emulsion phase mass transfer measurements Nhi Dang, Eindhoven University of Technology	14-4: Comparaison of impact and torque forces on erosion of oil shale particle processed in fluidized bed reactor Bouhafid Abdelmounaim, Semlalia Université Cadi Ayyad Marrakech Morocco
16:00 – 16:15	3-5: Multi-scale modeling of dense particle-laden flow including heat transfer Amit Patil, TU Eindhoven	14-5: Exploring the interplay between attrition and separation Ben Freireich, The Dow Chemical Company
16:30 – 17:00	ORGANIZING COMMITTEE & ECI MEETING	
17:00 – 19:00	POSTER SESSION 4 & SOCIAL HOUR (Oral Session 11, 12, 13 & 14 Papers)	
PM 42	Estimating the size of polar and apolar nanoparticle agglomerates in a fluidized bed Lilian de Martín, Delft University of Technology	
PM 44	Fluidization assistance of nanopowders by an alternating nonuniform electric field Jose Manuel Valverde, University of Seville	
PM 46	Fluidization of nanoparticles: The effect of surface characteristics J. Ruud van Ommen, Delft University of Technology	
PM 48	Microscopic characterization of mechanically assisted fluidized beds David Valdesueiro, Delft University of Technology	
PM 50	Experimental measurements and links between gas-fluidization and flow properties of fine lactose powders Clive Davies, Massey University	
PM 52	Agitated fluidization of nanopowders using mechanical stirring Daniel Lepek, The Cooper Union	
PM 54 (poster only)	Nanostructured materials for CO2 capturing: A comparison of two approaches Jose Manuel Valverde, University of Seville	

PM 56 (poster only)	Transition of fluidization mode for fine cohesive powders under mechanical vibrating conditions Yoshihide Mawatari, Kyushu Institute of Technology
PM 58	Non-Hg catalyst and fluidized-bed process: from lab-scale to industrial pilot trial for Chinese green PVC industry Guohua Luo, Tsinghua University
PM 60	A new method to intensify heat transfer capacity of an FCC catalyst cooler: Experimental validation Yongmin Zhang, China University of Petroleum
PM 62	The impact of a flue gas recirculation on temperature distribution and solids concentration inside a large-scale supercritical CFB boiler Artur Blaszczyk, Czestochowa University of Technology
PM 64	Flow development in the inlet section of a riser Maria N. Pantzali, Ghent University
PM 66	Analysis of length scales of solids volume fraction variations in a circulating fluidized bed of Geldart B particles Debanga Mondal, Åbo Akademi University
PM 68	Comparison of the gas and solids phase RTDS in a CFB downer reactor Martin R.J. Huard, ICFAR/Western University
PM 70	Particle clusters properties in gas–solid downer units Angel Lanza, University of Western Ontario
PM 72 (poster only)	The equalization function of a standpipe Ted M. Knowlton, PSRI
PM 74 (poster only)	Vertical solids distribution under air/carbon dioxide fluidization conditions in a circulating fluidized bed Wojciech Nowak, Czestochowa University of Technology
PM 76 (poster only)	CO - fluidization of fine particles and straw pellets at room and elevated temperatures Dmitry Viryasov, Tambov State Technical University
PM 78 (poster only)	Two-phase flow structure in a cold model gas-solid airlift loop reactor Mengxi Liu, China University of Petroleum
PM 80	Analysis of lateral fuel mixing in a fluid dynamically down-scaled bubbling fluidized bed Erik Sette, Chalmers University of Technology
PM 82	CO2 capture on fine activated carbon under sound assisted fluidization conditions Paola Ammendola, IRC-CNR
PM 84	Simulation of fuel mixing in fluidized beds using a combined tracking technique David Pallarès, Chalmers University of Technology
PM 86	Experimental studies of phase change materials in a bubbling fluidized bed María A. Izquierdo-Barrientos, Carlos III University of Madrid

PM 88	Development of a novel non-invasive IR technique for concentration measurements in gas-solid fluidized beds: Application to bubble-to-emulsion phase mass transfer measurements Nhi Dang, Eindhoven University of Technology
PM 90	Multi-scale modeling of dense particle-laden flow including heat transfer Amit Patil, TU Eindhoven
PM 92 (poster only)	Convective heat transfer coefficient in a bubbling fluidized bed with PCM María A. Izquierdo-Barrientos, Carlos III University of Madrid
PM 94 (poster only)	Effects of temperature and sorption on the hydrodynamics of gas-phase polymerization reactors Mariët Slagter, Eindhoven University of Technology
PM 96 (poster only)	The jiggled bed reactor, a new fluidized bed reactor for catalyst testing Franco Berruti, ICFAR/Western University
PM 98	Gas bypass and solids circulation rate of an I-CFB reactor with coarse particles Xiaotao Tony Bi, University of British Columbia
PM 100	Carbonization characteristics of biomass/coal blend for bio-coke Myung Won Seo, Korea Institute of Energy Research
PM 102	The gas flow in the loop seals of a dual circulating fluidized bed: Splitting of the fluidizing agent and gas leakage through the loop seals Karl Mayer, Vienna University of Technology
PM 104	A kinetic study of methanol to OLEFINS (MTO) process in fluidized bed reactor Lei Ying, Zhejiang University
PM 106	Comparison of impact and torque forces on erosion of oil shale particle processed in fluidized bed reactor Bouhafid Abdelmounaim, Semailia Université Cadi Ayyad Marrakech Morocco
PM 108	Exploring the interplay between attrition and separation Ben Freireich, The Dow Chemical Company
PM 110 (poster only)	Steam gasification of waste plastics in a conical spouted bed reactor Gartzen Lopez, University of the Basque Country
PM 112 (poster only)	Effects of particle properties, temperature and relative humidity on electrostatics in gas-solid fluidized beds Xiaotao Bi, University of British Columbia
PM 114	Technical aspects and thermodynamic evaluation of a two stage fluid bed-plasma process for solid waste gasification Paola Lettieri, University College of London
PM 116 (poster only)	Effect of vortex stabilizer and solids loading on erosion in 2nd stage cyclones S. B. Reddy Karri, PSRI
PM 118 (poster only)	Performance analysis of semifluidized bed biofilm reactors with liquid phase oxygen(LPO) utilisation C.M. Narayanan, National Institute of Technology

PM 120 (poster only)	Optimization of a pilot scale fluidized bed reactor through application of a novel internal Suren Sookai, Sasol Technology
PM 122 (poster only)	Control of the reaction zone in bubbling fluidized beds by means of secondary gas injection Timo Hensler, University of Erlangen-Nuremberg
PM 124 (poster only)	Development and large-scale optimization of fluidized-bed steam drying of lignite Joachim Werther, Hamburg University of Technology
PM 126 (poster only)	Technical superiority of fluidized bed over fixed bed for syngas methanation Xi Zeng, Chinese Academy of Sciences
PM 128	Fluidization and mixing of nanoparticle agglomerates assisted via magnetic impaction James Scicolone Rutgers University
19:00 – 19:15	POSTER PRIZE CEREMONY
19:15 – 21:00	FAREWELL PARTY

Friday, May 31, 2013

07:00 – 08:30	Breakfast
08:30 – 10:30	Departure of Buses
10:30 – 13:00	LOCAL ORGANIZING COMMITTEE MEETING & LUNCH