



DISPERSED TWO PHASE FLOW 2021



Ecole Normale Supérieure de Lyon



October 12th-14th, 2021

ORGANISED BY :

Société Hydrotechnique de France &

- ° Mickaël Bourgoïn (ENS de Lyon)
- ° Mathieu Guingo (EDF-MFEE, Paris- Chatou)
- ° Guillaume Laibe (CRAL, Lyon)
- ° Jean-Philippe Matas (Université Lyon 1)
- ° Aurore Naso (Ecole Centrale Lyon)
- ° Véronique Roig (IMFT, Toulouse)
- ° Valérie Vidal (ENS de Lyon)
- ° Romain Volk (ENS de Lyon)

IN ASSOCIATION WITH :



ONLINE EDITION



DISPERSED TWO-PHASE FLOWS 2021

*Meeting organized by Société Hydrotechnique de France
232nd Scientific & Technical session of SHF
October 12th-14th, 2021*

DAY 1 - Tuesday, October 12th

8h50-9h00 OPENING

9h00-10h00 Plenary conference: DEVAUCHELLE Olivier, Institut de Physique du Globe de Paris

10h00-11h00

SESSION 1 High-volume fraction- part 1

10h00-10h20 CHASSAGNE Rémi, Maurin R, Frey P and Chauchat J,

A FRICTIONAL-COLLISIONAL TWO-PHASE FLOW MODEL FOR SEDIMENT TRANSPORT

10h20-10h40 HENRY Christophe, Banari A, Henrique R, Eidt F, Lorenz P, Zimmer K, Hampel U and
Lécrivain G,

EVIDENCE OF COLLISION-INDUCED EFFECTS IN PARTICLE RESUSPENSION

10h40-11h00 FINTZI Nicolas, Pierson J.L. and Gamet L,

TOWARDS A GENERALIZED HYDRODYNAMIC DRAG LAW FOR CYLINDRICAL PARTICLES, EITHER ISOLATED OR IN PACKED BEDS

11h00-11h30 Coffee Break

11h30-12h30

SESSION 1 High-Volume fraction - part II

11h30-11h45 Le Roy De Bonneville Florian, Pierson J.L. and Simonin O,

DIRECT NUMERICAL SIMULATIONS OF SEDIMENTING CYLINDRICAL PARTICLES

11h45-12h00 FALKINHOFF Florencia, Ponomarenko A, Pierson J.L, Gamet L, Bourgoïn M and Volk R,

PORE-SCALE HYDRODYNAMICS IN FIXED BEDS OF SPHERICAL PARTICLES

12h00 -12h15 DE SOUZA David, Zürner T, Laliou J, Dejoan A and Monchaux R,



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SETTLING DYNAMICS OF INERTIAL PARTICLES

12h15-12h30 **ROMANO Francis**, Izard E and Fede P,

TOWARD CFD-DEM SIMULATIONS OF THE BLAST FURNACE RACEWAY

12h30-14h00 LUNCH BREAK

14h00-15h00

SESSION 2 Mixing, transfer, phase-change - part I

14h00-14h20 **MULLER Jean**, Ruyer P, Rulhiere R and CLAUSSE,

VAPORIZATION AT HIGH REDUCED PRESSURE INDUCED BY VERY RAPID POWER INPUT

14h20-14h40 **SCHLÜTER Michael**, Kexel F, Von Kameke A and Hoffmann M,

INVESTIGATION ON VELOCITY AND CONCENTRATION FIELDS AT TAYLOR BUBBLES IN A REACTIVE BUBBLY FLOW

14h40-15h00 **COLIN C**, Qaisar Raza M.D. and Sebilleau J,

LIFE SPAN OF A BUBBLE GROWING IN SHEAR FLOW IN MICROGRAVITY

15h00-15h30 Coffee break

15h30 - 17h00

SESSION 2 Mixing, transfer, phase-change - part II

15h30-15h45 **TORRES Loic**, Tanguy S, Colin C and Urbano A.F,

DIRECT NUMERICAL SIMULATION OF NUCLEATE BOILING IN MICROGRAVITY CONDITIONS

15h45-16h00 **NGU Vincent**, Morchain J and Cockx A,

REACTIVE BUBBLY FLOW SIMULATION USING TWO-WAY COUPLED 1D MODEL

16h00-16h15 **FAVRE Luc**, Pujet S, Mimouni S and Colin C,

NEPTUNE_CFD SIMULATIONS OF DEBORA-PROMOTEUR EXPERIMENTS : BOILING FREON IN A VERTICAL PIPE WITH MIXING VANES

16h15-16h30 **AYEGBA Paul**, Colin C and Sebilleau J,

DISPERSED BUBBLES CHARACTERISTICS AND THE EFFECT OF NUCLEATED BUBBLES ON UPWARD AND DOWNWARD BOILING FLOWS

16h30-16h45 **FERHAT Jacques**, Archer A, Mimouni S and Fortes-Patella R,

NUMERICAL SIMULATION OF UNSTEADY CLOUD CAVITATION ON A HYDROFOIL WITH NEPTUNE_CFD



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16h45-17h00 **FITSCHEN Jürgen**, Von Kameke A, Hoffmann M, Wucherpfennig T and Schlut M,
EXPERIMENTAL INVESTIGATION OF COMPARTMENT FORMATION IN AERATED STIRRED TANK REACTORS

17h00-17h30 Short discussion and poster presentations (2'/poster)

DAY 2 - Wednesday, October 13th

9h00-10h00 Plenary conference, **LEBREUILLY Ugo** - AIM, CEA, Université Paris-Saclay

10h00-11h00

SESSION 3 Numerical methods - part I

10h00-10h20 **GIRAULT Ivan**, Chadil M.A., Masi E, Simonin O and Vincent S,

A NEW METHOD TO ACCURATELY DETERMINE MOMENTUM, HEAT AND MASS TRANSFERS IN PARTICLE- RESOLVED SIMULATIONS

10h20-10h40 **REGNAULT Paul** and Vincent S,

FRONT-TRACKING APPROACHES FOR THE MODELLING OF INTERFACIAL DYNAMICS

10h40-11h00 **MATHIEU Antoine**, Chauchat J, Bonamy C, Balarac G and Hsu T.J.,

ACCOUNT FOR FINITE-SIZE EFFECTS IN TURBULENCE-RESOLVING TWO-FLUID SIMULATION OF SEDIMENT TRANSPORT

11h00-11h30 Coffee break

11h30-12h30

SESSION 3 Numerical methods - part II

11h30-11h45 **BUTAYE Edouard**, Ploquin M, Mer S, Toutant A and Bataille F,

EULER-EULER MULTI-SCALE SIMULATIONS OF INTERNAL TURBULENT BOILING FLOW WITH CONJUGATED HEAT TRANSFER

11h45-12h00 **LOMBART Maxime** and Laibe G,

HIGH-ORDER DISCONTINUOUS GALERKIN SCHEME FOR THE SMOLUCHOWSKI COAGULATION EQUATION

12h00-12h15 **BALVET Guilhem**, Ferrand M, Roustan Y, Henry C and Minier J.P.,

WALL FUNCTION BOUNDARY CONDITIONS FOR CONSISTENT HYBRID MOMENTS



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12h15-12h30 **Heulhard de Montigny Eric** and Llor A,

ROBUSTNESS AND CONSISTENCY OF POTENTIALLY-STIFF MULTI-WAY PRESSURE COUPLINGS IN COMPRESSIBLE MULTI-FLUID MODELS

12h30- 14h00 LUNCH BREAK

14h00:15h00

SESSION 4 Particles, drops & bubbles - part I

14h00-14h20 **BOTHE Dieter**, Brenn G and Niethammer M,

THE VELOCITY JUMP DISCONTINUITY FOR SINGLE BUBBLES RISING IN A VISCOELASTIC FLUID - INSIGHTS FROM DIRECT NUMERICAL SIMULATIONS

14h20-14h40 **PIERSON Jean-Lou**, Kharrouba M and Magnaudet J,

HYDRODYNAMIC TORQUE ON A ROTATING FINITE-LENGTH CYLINDRICAL PARTICLE

14h40-15h00 **KEWALRAMANI Gagan**, Bowen Ji, Gradeck M, Dossmann Y, Meignen R and Rimbart N,

EXPERIMENT ANALYSIS OF LAGRANGIAN STATISTICS FOR DROPS IN A TWO-PHASE JET

15h00-15h30 Coffee Break

15h30-17h00

SESSION 4 Particles, drops & bubbles - part II

15h30-15h45 **Bolaños-Jiménez Rocío**, Foronda-Trillo F.J. and Estepa-Cantero C,

DYNAMICS OF A BUBBLE RISING CLOSE TO A VERTICAL WALL

15h45-16h00 **MITROU Stamatina**, Mazzei L and Angeli P,

RHEOLOGY OF DILUTE POLYDISPERSE BUBBLE SUSPENSIONS

16h00-16h15 **FUSTER Daniel**,

BUBBLE-BUBBLE INTERACTIONS IN ACOUSTICALLY EXCITED BUBBLE CLUSTERS

16h15-16h30 **PAVLOV Lucas**, M. Verónica D'Angelo, Cachile M, Roig V and Ern P,

MOTION OF AN INERTIAL BUBBLE RISING IN A THIN-GAP CELL WITH IN-PLANE CONFINEMENT

16h30-16h45 **KENTHESWARAN Kalyani**, Dietrich N and Lalande B,

DIRECT NUMERICAL SIMULATION OF GAS-LIQUID MASS TRANSFER AROUND A CONTAMINATED BUBBLE

16h45-17h00 **RODGAR M**, Marié J.-L., Sclan H, Doppler D and Matas J.P.,

BUBBLE BEHAVIOR IN A HORIZONTAL HIGH-SPEED SOLID-BODY ROTATING FLOW

17h00-18h00 Discussion & POSTERS

DAY 3- Thursday, October 14th

9h00-10h00 Plenary Conference: AUGIER Frédéric, IFPEN

10h00-11h00

SESSION 5 Interfacial dynamics - part I

10h00-10h20 **MURAI Yuichi**, Oishi Y, Tanaka T, Jin Park H and Tasaka Y,

LOCAL BUBBLE CLUSTERS AMPLIFIED TO VOID WAVES IN HORIZONTAL BUBBLY TWO-PHASE TURBULENT BOUNDARY LAYERS

10h20-10h40 **RUIZ-RUS Javier**, Ern P, Roig V and MARTÍNEZ-BAZÁN C,

EXPLORATION OF COALESCENCE MECHANISMS IN CONFINED BUBBLE SWARMS

10h40-11h00 **MARCHIOLI Christian**, Hajisharifi A and Soldati A,

TURBULENCE-CONTROLLED EVOLUTION OF PARTICLE PATTERNS ON THE INTERFACE OF DEFORMABLE DROPS

11h00-11h30 Coffee Break

11h30-12h30

Session 5 Interfacial dynamics - part II

11h30-11h45 **ANGELI Panagiota**, Evripidou N, Anastasiou C,

MECHANISTIC MODELLING FOR THE SEPARATION OF DISPERSED LIQUID-LIQUID PIPE FLOWS

11h45-12h00 **MASSIERA Gladys**, Sahoo S, El Itawi H, Lalanne B, Masbernat O and Le Sauze N,

CROSSING OF A LIQUID-LIQUID INTERFACE BY A DROPLET AT HIGH INERTIA

12h00-12h15 **VETTORELLO Cyril**, Praud O and Roig V,

AIR-WATER GRAVITY-DRIVEN EXCHANGE FLOW

12h15-12h30 **CHAGOT Loïc**, Kalli M and Angeli P,

EXPERIMENTAL STUDY OF SURFACE ACTIVE AGENTS ON DROPLETS FORMED IN A MICROFLUIDIC CHANNEL



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12h30 - 14h00 LUNCH BREAK

14h00-15h00

Session 6 Particles in Turbulence - part I

14h00-14h20 **BASSET Thomas**, Viggiano B, Barois T, Gibert M, Mordant N, Volk R, Bourgoin M, Cal Raúl Bayoán

CHARACTERISATION OF ENTRAINMENT THROUGH TURBULENT DIFFUSION AND TWO-FLOW MODEL IN A JET

14h20-14h40 **POLANCO Juan Ignacio**, Krstulovic G,

PREFERENTIAL CONCENTRATION OF PARTICLES IN SUPERFLUID TURBULENCE

14h40-15h00 **MATAS Jean-Philippe**, Guyot G and Cartellier A,

PENETRATION DEPTH OF A PLUNGING JET: FROM MICROJETS TO CASCADES

15h00-15h30 Coffee Break

15h30-17h00

Session 6 Particles in Turbulence - part II

15h30-15h45 **CHAN Timothy T.K.**, Chong Shen Ng and Krug D,

BUBBLE-PARTICLE COLLISIONS IN HOMOGENEOUS ISOTROPIC TURBULENCE

15h45-16h00 **LAPLACE Benjamin**, Pedurand R, Bourgoin M and Volk R,

DOUBLE PHASE MEASUREMENT IN A RANDOM-JET-STIRRED TURBULENCE TANK

16h00-16h15 **MEES Loic**, Grandoni L, Salizzoni P, Pelliccioni A, Leuzzi G, Pini A, and Monti P,

INTERFEROMETRIC LASER IMAGING DROPLET SIZING FOR RESPIRATORY PARTICLES CHARACTERIZATION

16h15-16h30 **LEFEBVRE Anthony**, Mezui Y, Obligado M, Gluck S and Cartellier A,

A NEW DOPPLER OPTICAL PROBE FOR THE INVESTIGATION OF COMPLEX BEHAVIORS IN BUBBLE COLUMNS

16h30-16h45 **CAMPANA Lorenzo**, Bossy M and Henry C,

A LAGRANGIAN STOCHASTIC MODEL FOR ANISOTROPIC PARTICLES IN TURBULENT CHANNEL

16h45-17h00 **SACCONI Domenico**, Marchioli C and De Marchis M,

EFFECT OF ROUGHNESS ON RIGID FIBERS

17h00-18h00 discussion & POSTERS

CONCLUSION & POSTERS

POSTERS

- 1 **CABRERA Facundo**, Sheikh M.Z., Mehlig B, Plihon N, Bourgoin M, Pumir A and Naso A,
EXPERIMENTAL STUDY OF FLUID-INERTIA INFLUENCE ON THE TORQUE OF SLENDER BODIES SETTLING IN QUIESCENT FLOWS AT LOW RE
- 2 **BOUCHER Alexandre**, Belt R, Le Men C and Liné A,
ON THE HYDRODYNAMICS OF ELONGATED GAS BUBBLES IN SLIGHTLY INCLINED PIPES AND VISCOUS LIQUIDS
- 3 **LLOR Antoine**, Heulhard de Montigny E and Vazquez-Gonzalez T,
PLAYING (ALMOST) SAFE ON ROBUSTNESS & ENTROPY IN COMPRESSIBLE MULTI-FLUID DYNAMICS WITH GEOMETRY, ENERGY (GEEC)
- 4 **Heulhard de Montigny Eric** and Llor A,
PRESERVING ISENTROPIC CONSISTENCY IN MULTI-FLUID SYSTEMS: BASIC ENERGY CLOSURES AND VARIATIONAL EVOLUTION EQUATIONS
- 5 **Manach-Perennou Bastien**, Chauvin R and Guisset S,
DIFFUSE INTERFACE STRATEGY FOR MULTIMATERIAL RADIATION HYDRODYNAMICS
- 6 **EL OUAFA Mohamed**, Vincenu-Pem S and Lechenadec V (V.L.C.),
BLOCK PRECONDITIONING OF MONOLITHIC SOLVERS FOR INCOMPRESSIBLE TWO-PHASE FLOWS AT LARGE DENSITY AND VISCOSITY RATIOS
- 7 **YANG Dapeng**, Sergis A and Hardalupas Y,
BUBBLE FORMATION FROM AN ARTIFICIAL CAVITY AND ITS TEMPORAL EVOLUTION DURING FLOW BOILING
- 8 **DAVY Germain**, Reyssat E, Vincent S and Mimouni S,
CFD MODELING OF TWO-PHASE FLOWS WITH PHASE CHANGE IN MODEL CRACKS

PARTNERS

