

7th International Conference on Fluid Mechanics 2015 (ICFM7)

Frontiers in Fluid Mechanics Research

Procedia Engineering Volume 126

Qingdao, China
24 - 27 March 2015

Editors:

**Jiachun Li
Jing Fan**

ISBN: 978-1-5108-1620-6

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© by Elsevier B.V.
All rights reserved.

Printed by Curran Associates, Inc. (2016)

For permission requests, please contact Elsevier B.V.
at the address below.

Elsevier B.V.
Radarweg 29
Amsterdam 1043 NX
The Netherlands

Phone: +31 20 485 3911
Fax: +31 20 485 2457

<http://www.elsevierpublishingsolutions.com/contact.asp>

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

| | |
|---|----|
| PREFACE | 1 |
| <i>Jiachun Li, Jing Fan</i> | |
| <u>PLENARY LECTURES</u> | |
| RESONANT LIQUID MOTION IN MARINE HYDRODYNAMICS | 6 |
| <i>O. M. Faltinsen</i> | |
| NEW RESULTS ON THE INCIPIENT SEPARATION OF SHOCK/BOUNDARY-LAYER INTERACTIONS | 12 |
| <i>Frank K. Lu</i> | |
| ANALYSIS OF TURBULENCE SUPPRESSION IN SEDIMENT-LADEN SALINE CURRENTS | 16 |
| <i>Mrugesh Shringarpure, Mariano I. Cantero, S. Balachandar</i> | |
| AN EXTENDED VIEW OF THE INNER-OUTER INTERACTION MODEL FOR WALL-BOUNDED TURBULENCE USING SPECTRAL LINEAR STOCHASTIC ESTIMATION | 24 |
| <i>Ivan Marusic, Woutijn J. Baars, Nicholas Hutchins</i> | |
| <u>FLOW INSTABILITY AND TURBULENCE</u> | |
| THE EFFECTS OF HEATING ON NOISE GENERATION IN SUBSONIC TRANSITIONAL JETS | 29 |
| <i>Zhen-Hua Wan, Hai-Hua Yang, Xing-Chen Zhang, De-Jun Sun</i> | |
| TRANSITION OF TRANSIENT TURBULENT CHANNEL FLOW | 34 |
| <i>Shuisheng He, Mehdi Seddighi, Sam Gorji, Akshat Mathur</i> | |
| ELECTRIC FIELD ENHANCES MIXING IN MICRO CIRCULAR PIPES | 39 |
| <i>Zijing Ding, Teck Neng Wong</i> | |
| NUMERICAL SIMULATION OF SUPERSONIC SHEAR LAYER WITH PLASMA ACTUATOR | 44 |
| <i>Ke Lin, Hong Yan</i> | |
| TRANSIENT GROWTH OF AXISYMMETRIC PERTURBATIONS IN CO-ROTATING TAYLOR- COUETTE FLOW OF A BINGHAM FLUID | 49 |
| <i>Cheng Chen, Wei Zhang, Wei-Guo Zhang</i> | |
| INSTABILITIES OF THERMOCAPILLARY FLOWS BETWEEN COUNTER-ROTATING DISKS | 54 |
| <i>Kai-Xin Hu, Meng He, Qi-Sheng Chen</i> | |
| ACTIVE CONTROL OF A PLANAR OFFSET ATTACHING JET USING SYNTHETIC JETS | 58 |
| <i>Yu Xia, Xuanhe Liu, Nan Gao</i> | |
| THE EFFECTS OF TEMPERATURE ON VORTEX-PAIRING NOISE IN AXISYMMETRIC SUBSONIC JETS | 63 |
| <i>Hai-Hua Yang, Lin Zhou, Zhen-Hua Wan, De-Jun Sun</i> | |
| SIMULATION AND STABILITY STUDY OF THE FLOW AROUND A CYLINDER IN INFINITE DOMAIN | 68 |
| <i>An-Qing Ben, Hua-Shu Dou</i> | |
| INVESTIGATIONS ON THE FEATURE OF TURBULENT VISCOSITY ASSOCIATED WITH VORTEX SHEDDING | 73 |
| <i>Q. Li, Q. W. Ma, S. Yan</i> | |
| NON-PARALLEL-FLOW EFFECT ON COMPRESSIBLE BOUNDARY LAYER ON A FLAT PLATE | 78 |
| <i>Zhangfeng Huang, Xuesong Wu</i> | |
| SPANWISE CHARACTERISTICS OF FLOW CROSSING A YAWED CIRCULAR CYLINDER OF FINITE LENGTH | 83 |
| <i>Hui Liang, Sheng-Yao Jiang, Ri-Qiang Duan</i> | |
| LARGE EDDY SIMULATION WITH SUB-GRID STRESS DETERMINED BY MOLECULAR SIMULATION AND ITS APPLICATIONS FOR TURBULENT CHANNEL FLOWS | 88 |
| <i>Dandan Zeng, Fengquan Zhong, Jing Fan</i> | |
| EFFECT OF INITIALIZED METHOD ON THE THREE-DIMENSIONAL SECONDARY WAKE INSTABILITY OF ELONGATED BLUFF BODY | 93 |
| <i>Xinming Wu, Yuxuan Zhang, Weipeng Li</i> | |

| | |
|---|-----|
| REGULARIZATION OF WALL-WALL TURBULENCE BY DISCRETE ROUGHNESS ELEMENT | 98 |
| <i>Chong Pan, Jianjie Wang, Ning Zhou, Jinjun Wang</i> | |
| LABORATORY EXPERIMENT ON TURBULENT MIXING AND FRACTAL DIMENSION OF A DENSITY INTERFACE IN A STABLY STRATIFIED FLUID | 103 |
| <i>John Z. Shi, Shuang Zhang</i> | |
| TRIANGLE CYLINDER WAKE ANALYSIS BASED ON WAVELET AND POD TECHNIQUES | 108 |
| <i>Yan Zheng, Akira Rinoshika, Shun Fujimoto</i> | |
| DNS OF DIFFERENTIAL THERMAL AND MASS DIFFUSIONS IN FREE TURBULENT SHEAR FLOWS | 113 |
| <i>Kun Zhou, Ming Xiao, Xiao Jiang, Tat Leung Chan</i> | |
| THE REALIZATION OF NON-REFLECTING BOUNDARIES FOR COMPRESSIBLE RAYLEIGH-TAYLOR FLOWS WITH VARIABLE ACCELERATION HISTORIES | 118 |
| <i>Yousheng Zhang, Zhiwei He, Xinliang Li, Baolin Tian</i> | |

AERODYNAMICS AND GAS DYNAMICS

| | |
|--|-----|
| CFD/CSD APPROACH TO PREDICT HYPERSONIC AEROTHERMOELASTIC RESPONSE OF A WING | 123 |
| <i>Jinan Lv, Fangjian Wang, Li Guo, Ziqiang Liu</i> | |
| STATIC INSTABILITY OF MARTIAN ENTERING VEHICLES AT SMALL ANGLE OF ATTACK | 128 |
| <i>Junming Lyu, Changchang Liu, Wenbo Miao, Xiaoli Cheng</i> | |
| QUASI-PERIODIC AERODYNAMIC HEATING IN BLUNT-FIN INDUCED SHOCK WAVE/BOUNDARY LAYER INTERACTION | 134 |
| <i>Y. Q. Zhuang, X. Y. Lu</i> | |
| HORSESHOE VORTEX CONTROL USING STREAMWISE VORTICES | 139 |
| <i>Md. Yamin Younis, Hua Zhang, Reivwei Zhu, Zaka Muhammad</i> | |
| A NOVEL APPROACH TO UNCOVER MECHANISMS OF AERODYNAMIC FORCES ACTING ON A BODY IN INCOMPRESSIBLE FLOWS | 145 |
| <i>Yongliang Yu</i> | |
| LARGE EDDY SIMULATION OF BASE DRAG REDUCTION WITH JET BOAT-TAIL PASSIVE FLOW CONTROL | 150 |
| <i>Yunchao Yang, Heyong Xu, Jianlei Wang, Gecheng Zha</i> | |
| NUMERICAL STUDY OF DUCTED-FAN LIP STALL SUPPRESSION BASED ON INFLATABLE LEADING LIP CELL | 158 |
| <i>He-Yong Xu, Shi-Long Xing, Zheng-Yin Ye</i> | |
| NUMERICAL INVESTIGATION OF HYPERSONIC UNSTEADY FLOW AROUND A SPIKED BLUNT-BODY | 163 |
| <i>Yu Ma, Xiaowei Liu, Ping Ou</i> | |
| A MODIFIED NAVIER-STOKES EQUATION FOR INCOMPRESSIBLE FLUID FLOW | 169 |
| <i>Shuangling Dong, Songping Wu</i> | |
| AERODYNAMIC INVESTIGATION OF RAE2822 AIRFOIL IN GROUND EFFECT | 174 |
| <i>Shaowei Li, Danjie Zhou, Yuanjing Zhang, Qiulin Qu</i> | |
| NUMERICAL INVESTIGATION OF THE UNSTEADY BEHAVIOR OF A HYPERSONIC INLET UNDER THROTTLING | 179 |
| <i>Pei-Zhao Sun, Hai-Tao Shi, Xi-Yun Lu</i> | |
| DESIGN PROCESS OF SUPERSONIC ISENTROPIC INLET WITH EXPANSION WAVE CONCEPT | 184 |
| <i>Yuanguang Wang, Shuo Zhou, Jingtao Guo</i> | |
| GRADIENT-BASED AEROTHERMODYNAMIC OPTIMIZATION OF A HYPERSONIC WING PROFILE | 189 |
| <i>Chenchao Xia, Weifang Chen</i> | |
| NUMERICAL SIMULATION ON THE SHOCK WAVE/BOUNDARY LAYER INTERACTION WITH HEATING/COOLING EFFECT | 194 |
| <i>Duo Zhang, Weidong Liu, Bo Wang, Yi Su</i> | |
| FREE-STREAM TURBULENCE EFFECTS ON LONG-SPAN BRIDGE AERODYNAMICS | 199 |
| <i>Steven J. Daniels, Zheng-Tong Xie</i> | |
| TURBULENCE-FLAME INTERACTION IN AN EVAPORATING AND COMBUSTING DROPLET | 204 |
| <i>Lixing Zhou, Ke Li</i> | |

| | |
|--|------------|
| OBLIQUE SHOCK TO DETONATION TRANSITION IN HYDROGEN-AIR MIXTURES | 209 |
| <i>Tao Wang, Yining Zhang, Honghui Teng, Zonglin Jiang</i> | |

HYDRODYNAMICS

| | |
|--|------------|
| ANALYTICAL MODEL FOR CONCAVE SHORELINE INDUCED BY THE 2011 TSUNAMI..... | 214 |
| <i>Hitoshi Tanaka, Vo Cong Hoang, Yuta Mitobe</i> | |
| WAVE INTERACTION WITH POROUS VERTICAL BREAKWATER IN TWO-LAYER FLUID | 218 |
| <i>Menghua Zhu, Hua Huang, Jiemin Zhan, Lin Guo, Ruizhi Chen</i> | |
| THREE-DIMENSIONAL INSTABILITY IN THE WAKE OF A PITCHING FOIL | 223 |
| <i>Jian Deng, Liping Sun, Xueming Shao</i> | |
| THE MOTION OF SMALL BUBBLE IN THE IDEAL VORTEX FLOW | 228 |
| <i>L. Y. Chen, L. X. Zhang, X. M. Shao</i> | |
| LANDSLIDE-GENERATED IMPULSE WAVES IN DEEP V CHANNEL: RUNUP AND NEAR FIELD CHARACTERISTICS | 232 |
| <i>C. Q. Shi, Y. An, Q. Q. Liu</i> | |
| AN FEM-LEVEL-SET NUMERICAL MODEL FOR POTENTIAL FLOW WITH FREE SURFACE | 237 |
| <i>Longfei Cong, Bin Teng</i> | |
| NUMERICAL EXAMINATION OF WAVE-INDUCED COUPLING ROLL MOTION AND FLUID RESONANCE BETWEEN TWIN FLOATING BARGES IN PROXIMITY | 242 |
| <i>Shu Li, Bin Teng</i> | |
| WATER TUNNEL EXPERIMENTAL INVESTIGATION ON DRAG REDUCTION OF COATING SURFACE WALL | 247 |
| <i>Yan Yao, Jin-Ling Luo, Hao Liu, Kun Zhu</i> | |
| WAVE INTERACTIONS WITH A POROUS AND FLEXIBLE CYLINDRICAL FISH CAGE | 254 |
| <i>Wei Su, Jie-Min Zhan, Hua Huang</i> | |
| AXIAL AND TRANSVERSE COUPLED VIBRATION CHARACTERISTICS OF DEEP-WATER RISER WITH INTERNAL FLOW | 260 |
| <i>Liang Zhang, Han Wu, Yang Yu, Xiaohui Zeng, Jifu Zhou, Binqi Xie, Min Shi, Shanlin Huang</i> | |
| A SEAKEEPING ANALYSIS METHOD FOR T-CRAFT | 265 |
| <i>Zhiqun Guo, Qingwei Ma, Hanbing Sun</i> | |
| WAVE-INDUCED HYDRODYNAMIC RESPONSES OF AN IMMERSED RIGID BODY CONNECTED WITH ELASTIC PLATES IN A TWO-LAYER FLUID..... | 270 |
| <i>Q. R. Meng, D. Q. Lu</i> | |
| FLUID FLOW IN A CAVITY DRIVEN BY AN OSCILLATING LID BY AN IMPROVED INCOMPRESSIBLE SPH | 275 |
| <i>Zhenhong Hu, Xing Zheng, Qing-Wei Ma, Wen-Yang Duan</i> | |
| MODELING OF THE PROPULSION HYDRODYNAMICS FOR THE WATER STRIDER LOCOMOTION ON WATER SURFACE..... | 280 |
| <i>Jun Zheng, Kaiping Yu, Jiazhong Zhang, Junfeng Wang, Changfeng Li</i> | |
| UNSTEADY CHARACTERISTICS OF SEDIMENT TRANSPORT UNDER NON-HARMONIC WAVES | 285 |
| <i>Yinjun Li, Jifu Zhou</i> | |
| ANALYSES OF WAVE FORCES ON SURFACE PIERCING VERTICAL CYLINDERS OF INTERMEDIATE SCALE | 290 |
| <i>Ling Chen, Jifu Zhou</i> | |
| NUMERICAL INVESTIGATION OF ROCK BREAKING MECHANISMS BY HIGH PRESSURE WATER JET..... | 295 |
| <i>Hailong Chen, Zhaomin Li, Zhihan Gao, Yuanyuan Sun</i> | |
| ON TWO DESCRIPTIONS FOR MANY MOVING BODIES THROUGH INVISCID FLUID | 300 |
| <i>Yi Qin, Ren Sun</i> | |
| MEASUREMENT AND ANALYSIS OF THE INTERACTION BETWEEN INTERNAL SOLITARY WAVE AND SUBMERGED SLENDER BODY IN A STRATIFIED FLUID TANK..... | 305 |
| <i>Gang Wei, Hui Du, Mengmeng Gu, Xinglong Wang</i> | |
| THE NUMERICAL SIMULATION OF PROPELLER SHEET CAVITATION WITH A NEW CAVITATION MODEL | 310 |
| <i>Dengcheng Liu</i> | |
| SIMULATION OF FLOWS THROUGH SUBMERGED VEGETATION PATCHES USING MACROSCOPIC TURBULENCE MODELS | 315 |
| <i>Zhiya Chen, C. W. Li, Jiemin Zhan</i> | |

| | |
|--|-----|
| NATURAL CONVECTION IN NEAR SHORE WATERS SUBJECT TO PERIODIC THERMAL FORCING | 321 |
| <i>Yadan Mao</i> | |
| THE EFFECT OF TRIMMING AND SINKAGE ON THE TRIMARAN RESISTANCE CALCULATION | 327 |
| <i>Rui Deng, Chao Li, Debo Huang, Guangli Zhou</i> | |
| NUMERICAL STUDY OF POTENTIAL EXTREME TSUNAMI HAZARD IN SOUTH CHINA SEA | 332 |
| <i>Zhi-Yuan Ren, Hua Liu</i> | |
| APPLICATION OF COMPRESSIBLE MULTI-COMPONENT FLOW IN UNDERWATER EXPLOSION PROBLEMS | 339 |
| <i>Yu Jun, Pan Jian-Qiang, Wang Hai-Kun, Mao Hai-Bin</i> | |
| INTERACTION BETWEEN REFLECTED SHOCK AND BUBBLE IN NEAR-WALL UNDERWATER EXPLOSION | 344 |
| <i>B. C. Nie, J. C. Li, H. Q. Zhang</i> | |
| VARIATION TENDENCY OF TC ACTIVITY IN THE NWP | 349 |
| <i>G. Q. Lyu, J. C. Li, H. Q. Zhang</i> | |

INDUSTRIAL AND ENVIRONMENTAL FLUID MECHANICS

| | |
|---|-----|
| COUPLING FLUID FLOW MODEL OF MULTISCALE FRACTURES IN TIGHT RESERVOIRS | 353 |
| <i>Yuliang Su, Binglin Li, Chen Xu, Yongmao Hao</i> | |
| INVESTIGATION OF UNSTEADY EFFECTS ON A TWO-STAGE COUNTER-ROTATING FAN | 358 |
| <i>Hengming Zhang, Xiuquan Huang, Xiang Zhang</i> | |
| LONGITUDINAL AND TRANSVERSE ROLLS IN A TRIANGULAR CAVITY | 362 |
| <i>Huimin Cui, Feng Xu</i> | |
| SEDIMENT CONCENTRATION IN STEADY RILL FLOW: AN ANALYTICAL STUDY | 367 |
| <i>Y. M. Li, Y. An, Q. Q. Liu</i> | |
| DIRECT NUMERICAL SIMULATION OF THREE-DIMENSIONAL GRAVITY CURRENT ON A UNIFORM SLOPE | 372 |
| <i>A. Ooi, N. Zgheib, S. Balachandar</i> | |
| A THREE-FIELD COUPLED MODEL FOR SEEPAGE FAILURE | 377 |
| <i>Bo Peng, Jiachun Li</i> | |
| MODELLING THREE-DIMENSIONAL INTERFACIAL FLOW WITH SAND DUNES | 382 |
| <i>Xiaobing Chen, Li Chen, Liqun He</i> | |
| COMPARISON OF STEADY BLOWING AND SYNTHETIC JETS FOR AERODYNAMIC DRAG REDUCTION OF A SIMPLIFIED VEHICLE | 388 |
| <i>Wenshi Cui, Hui Zhu, Chao Xia, Zhigang Yang</i> | |
| TRANSIENT FLOWS AROUND A FIN AT DIFFERENT POSITIONS | 393 |
| <i>Jia Ma, Feng Xu</i> | |
| INFLUENCE OF THE WHEEL ROTATION ON UNDERBODY FLOW AND AERODYNAMIC FORCES OF HIGH SPEED TRAIN | 399 |
| <i>Jiali You, Yu Chen, Zhigang Yang</i> | |
| EFFECTS OF GREEN ROOF ON THE WIND FIELD OF A LOW-RISE BUILDING | 405 |
| <i>Wing-Hong Onyx Wai, Wen-Qing Hu, Chi-Wai Li, Jie-Min Zhan</i> | |
| TRANSIENT SIMULATION OF HEAT TRANSFERS FOR VEHICLE EXHAUST SYSTEM | 410 |
| <i>Guoquan Xiao</i> | |
| MODELING CONE SELF-ACTING GAS LUBRICATION BEARING DYNAMICS | 416 |
| <i>Guangqiang Chen, Yunjun Yang, Rongyan Ma, Bingyan Chen</i> | |
| THE INFLUENCE OF TEMPERATURE GRADIENT ON THE CONVECTIVE MIXING PHENOMENA OF GEOLOGIC SEQUESTRATION OF CO₂ | 421 |
| <i>Jun-Jun Sun, Qing-Yong Zhu, Huai-Zhong Yu</i> | |

BIOFLUID MECHANICS

| | |
|---|-----|
| VORTICITY DYNAMICS AND CONTROL OF THE THREE DIMENSIONAL SELF-PROPELLED TRAVELLING WAVE WALL IN GROUND EFFECT | 426 |
| <i>Zhi-Qiang Xin, Chui-Jie Wu</i> | |
| SELF-PROPULSION OF A FLEXIBLE PLUNGING FOIL NEAR A SOLID WALL | 431 |
| <i>Longzhen Dai, Guowei He, Xing Zhang</i> | |

| | |
|---|-----|
| IVUS-BASED FLUID-STRUCTURE INTERACTION MODELS FOR NOVEL PLAQUE VULNERABILITY INDICES: A STUDY IN PATIENTS WITH CORONARY ARTERY DISEASE | 436 |
| <i>Liang Wang, Akiko Meahara, Chun Yang, Jie Zheng, Richard Bach, David Muccigrosso, Gary S. Mintz, Dalin Tang</i> | |
| FSI MODELING APPROACH TO DEVELOP RIGHT VENTRICLE PULMONARY VALVE REPLACEMENT SURGICAL PROCEDURES WITH A CONTRACTING ACTUATOR AND IMPROVE VENTRICLE EJECTION FRACTION | 441 |
| <i>Chun Yang, Dalin Tang, Nikolay Vasilyev, Rahul Rathod, Tal Geva, Pedro J. Del Nido</i> | |
| USING 3D ECHO-BASED MODELING TO QUANTIFY IN VIVO VENTRICLE MATERIAL PROPERTIES: A MULTI-PATIENT STUDY | 446 |
| <i>Longling Fan, Jing Yao, Chun Yang, Di Xu, Dalin Tang</i> | |
| USING 2D IN VIVO IVUS-BASED MODELS FOR HUMAN CORONARY PLAQUE PROGRESSION ANALYSIS AND COMPARISON WITH 3D FSI MODELS | 451 |
| <i>Hongjian Wang, Liang Wang, Jie Zheng, Jian Zhu, Akiko Maehara, Chun Yang, Richard Bach, David Muccigrosso, Gary S. Mintz, Dalin Tang</i> | |

PLASMA AND MAGNETO-HYDRODYNAMICS

| | |
|---|-----|
| DERIVATION OF A CONTINUUM MODEL FOR LOW TEMPERATURE PLASMA FLOW AND ITS APPLICATION ON ARC DISCHARGE | 456 |
| <i>Bijie Yang, Quanhua Sun</i> | |
| MHD EFFECTS IN THE U-BEND OF DCLL BLANKET | 461 |
| <i>Long Chen, Mingjian Li, Mingjiu Ni, Nianmei Zhang</i> | |

MULTIPHASE FLOWS, NON-NEWTONIAN FLOWS AND FLOWS IN POROUS MEDIA

| | |
|--|-----|
| PROGRESS ON FLOW MECHANISM IN LOW PERMEABILITY FORMATION | 466 |
| <i>Hu Guo, Fuyong Wang, Yiqiang Li, Zhaoyan Yu, Xian Gao, Yuanyuangu, Jing Chen, Feng Shasha, Zhang Xinling</i> | |
| MODELLING OF MIGRATION OF CO₂ IN POROUS MEDIA UNDER CONDITIONS OF SALINE AQUIFERS USING LATTICE BOLTZMANN METHOD | 471 |
| <i>Y. Q. Zu</i> | |
| A NUMERICAL INVESTIGATION OF THE DYNAMIC WETTING TRANSITION ON A MOVING SUBSTRATE | 476 |
| <i>Ao Liu</i> | |
| CFD SIMULATION OF SLUGS DISSIPATION FOR THE INLET PIPELINE OF CYLINDRICAL CYCLONE SEPARATOR | 481 |
| <i>Xiaoming Luo, Yibin Wang, Limin He, Geng Geng</i> | |
| LONG CRACKS FRACTURED VERTICAL WELL NUMERICAL SIMULATION AND APPLICATION FOR TIGHT OIL RESERVOIR | 486 |
| <i>Jianbin Fu, Ruizhong Jiang, Jianchun Xu, Bin Hou</i> | |
| THE FLOW OF VISCOELASTIC POLYMER SOLUTION IN POROUS MEDIA | 491 |
| <i>Gang Yang, Ruizhong Jiang, Guangwei Han, Pandeng Xu</i> | |
| THREE DIMENSIONAL NUMERICAL SIMULATION OF MELT FILLING PROCESS IN MOLD CAVITY WITH INSETS | 496 |
| <i>Qiang Li</i> | |
| HEAT TRANSFER DURING THE DISSOCIATION OF HYDRATE IN POROUS MEDIA | 502 |
| <i>Z. Zhang</i> | |
| PHASE-FIELD-BASED FINITE VOLUME METHOD FOR SIMULATING THERMOCAPILLARY FLOWS | 507 |
| <i>Long Qiao, Zhong Zeng, Haiqiong Xie</i> | |
| FRACTURE NETWORK NUMERICAL WELL TEST MODEL BASED ON THE DISCRETE-FRACTURE MODEL | 512 |
| <i>Yizhao Wan, Yuewu Liu, Weiping Ouyang, Congcong Niu, Guofeng Han, Wenhao Liu</i> | |
| A MODEL OF UNSTEADY SEEPAGE FLOW IN LOW-PERMEABLE COALBED WITH MOVING BOUNDARY IN CONSIDERATION OF WELLBORE STORAGE AND SKIN EFFECT | 517 |
| <i>Wenchao Liu, Yuewu Liu, Congcong Niu, Guofeng Han, Yizhao Wan</i> | |

EXPERIMENTAL FLUID MECHANICS

| | |
|---|-----|
| EXPERIMENTAL STUDY ON SIZE AND VELOCITY OF CHARGED DROPLETS | 522 |
| <i>Zhentao Wang, Yonghui Zhang, Tianyu Guo, Zhonghui Zhu, Xiaoying Wang, Jianlong Wen</i> | |
| WALL INTERFERENCE EFFECT ON THE AERODYNAMICS OF A HIGH-SPEED TRAIN | 527 |
| <i>Chao Xia, Xizhuang Shan, Zhigang Yang</i> | |
| MEASURING LARGE SCALE FLOW STRUCTURES BEHIND A BLUFF BODY USING A HOT-WIRE RAKE | 532 |
| <i>Nan Gao, Yaqing Li, Honglei Bai</i> | |
| EXPERIMENTAL STUDY OF FLOW PAST OBSTACLES BY PIV | 537 |
| <i>Bin Liao, Shan-Qun Chen</i> | |
| TERRAIN EFFECTS ON CHARACTERISTICS OF SURFACE WIND AND WIND TURBINE WAKES | 542 |
| <i>Wei Tian, Ahmet Ozbay, Hui Hu</i> | |
| SPONTANEOUS IMBIBITION LAWS AND THE OPTIMAL FORMULATION OF FRACTURING FLUID DURING HYDRAULIC FRACTURING IN ORDOS BASIN | 549 |
| <i>Guijuan Wang, Zhenfeng Zhao, Kai Li, Aifen Li, Bingqing He</i> | |
| A VIRTUAL PARTICLE IMAGES GENERATION SYSTEM FOR 3D-PTV VERIFICATION | 554 |
| <i>Chengwu Wang, Zhen Wei</i> | |
| EXPERIMENTAL STUDY ON GROUND EFFECT OF A WING WITH TIP SAILS | 559 |
| <i>Chenghong Sun, Chin Dai</i> | |
| FLUID-STRUCTURE COUPLING BETWEEN TWO TANDEM ELASTIC CYLINDERS | 564 |
| <i>Qin Sun, Md. Mahbub Alam, Yu Zhou</i> | |

COMPUTATIONAL FLUID DYNAMICS

| | |
|--|-----|
| LARGE-EDDY SIMULATION OF UNDEREXPANDED SONIC COAXIAL JET | 569 |
| <i>Hai-Tao Shi, Pei-Zhao Sun, Xi-Yun Lu</i> | |
| TRANSIENT THERMODYNAMIC BEHAVIORS OF SUPER-HIGH TEMPERATURE GAS-CARRYING DUCT UNDER RAPID DEPRESSURIZATION | 574 |
| <i>Jingbao Liu, Tao Ma, Shengyao Jiang, Riqiang Duan</i> | |
| A SMOOTHED PARTICLE HYDRODYNAMICS METHOD FOR MODELLING SOIL-WATER INTERACTION | 579 |
| <i>Q. Wu, Y. An, Q. Q. Liu</i> | |
| DETACHED-EDDY SIMULATION OF SUBSONIC FLOW PAST A DELTA WING | 584 |
| <i>Yang Zhang, Laiping Zhang, Xin He, Xiaogang Deng</i> | |
| NUMERICAL STUDY OF CENTRIFUGAL FAN WITH SLOTS IN BLADE SURFACE | 588 |
| <i>Rui Rong, Ke Cui, Zijun Li, Zhengren Wu</i> | |
| NUMERICAL SIMULATION OF A STARTING BUOYANT JET FROM A CHANNEL | 592 |
| <i>Manman Qiao, Feng Xu</i> | |
| NUMERICAL INVESTIGATION ON LIMITATION OF BOUSSINESQ EQUATION FOR GENERATING FOCUSING WAVES | 597 |
| <i>J. H. Wang, Q. W. Ma</i> | |
| NUMERICAL INVESTIGATION ON MICROELECTRONIC CHIP COOLING USING MULTIPLE ORIFICE SYNTHETIC JET ACTUATOR BASED ON THEORY FIELD SYNERGISM | 602 |
| <i>Yao Ma, Zhi-Xun Xia, Zhen-Bing Luo, Xiong Deng, Xuan Ma</i> | |
| NUMERICAL STUDY ON HOMOGENEOUS CONDENSATION IN A VORTEX | 607 |
| <i>Yun Cao, Xisheng Luo</i> | |
| NUMERICAL SIMULATION OF CONVECTIVE-RADIATIVE COUPLED HEAT TRANSFER PERFORMANCE FOR HIGH ALTITUDE AIRSHIPS | 612 |
| <i>Rong Ma, Wei Yao, Zhenxun Gao, Xiaochen Lu, Haichao Xue, Yao Wu</i> | |
| NUMERICAL STUDY OF SHOCK/BOUNDARY LAYER INTERACTION OF CHEMICALLY REACTING FLOW IN SHOCK TUBE | 617 |
| <i>Song Chen, Quanhua Sun</i> | |
| A NEW PARALLEL ALGORITHM OF DSMC METHOD | 622 |
| <i>Fei Huang, Xuhong Jin, Wenlong Mei, Xiaoli Cheng</i> | |
| APPLICATIONS OF HIGH ORDER HYBRID DG/FV SCHEMES FOR TWO-DIMENSIONAL RANS SIMULATIONS | 628 |
| <i>Ming Li, Wei Liu, Laiping Zhang, Xin He</i> | |

| | |
|---|------------|
| APPLICATIONS OF DYNAMIC CARTESIAN GRIDS METHOD ON UNSTEADY FLOWS INVOLVING MOVING BOUNDARIES | 633 |
| <i>Xiaowen Liu, Weijiang Zhou, Chuqun Ji</i> | |
| ON THE GEOMETRIC CONSERVATION LAW FOR UNSTEADY FLOW SIMULATIONS ON MOVING MESH | 639 |
| <i>Rong Ma, Xinghua Chang, Laiping Zhang, Xin He, Ming Li</i> | |
| HYPERFLOW: A STRUCTURED/UNSTRUCTURED HYBRID INTEGRATED COMPUTATIONAL ENVIRONMENT FOR MULTI-PURPOSE FLUID SIMULATION | 645 |
| <i>Xin He, Xianyao He, Lei He, Zhong Zhao, Laiping Zhang</i> | |
| INCOMPRESSIBLE SPH BASED ON RANKINE SOURCE SOLUTION FOR WATER WAVE IMPACT SIMULATION | 650 |
| <i>Xing Zheng, Zhenhong Hu, Qing-Wei Ma, Wen-Yang Duan</i> | |
| A NEW BOUNDARY TREATMENT METHOD FOR SMOOTHED PARTICLE HYDRODYNAMICS | 655 |
| <i>Shan-Qin Jin, Xing Zheng, Wen-Yang Duan, Kang-Ning Niu</i> | |
| SIMULATE WAVE BODY INTERACTION BASED ON THE INCOMPRESSIBLE SPH METHOD | 660 |
| <i>Xi-Peng Lv, Xing Zheng, Ni-Bo Zhang, Kang-Ning Niu</i> | |
| NUMERICAL SIMULATION OF VIOLENT WAVE IMPACT BY ISPH METHOD | 665 |
| <i>Kang-Ning Niu, Xing Zheng, Ye Miao, Xi-Peng Lv</i> | |
| A CORRECTED INCOMPRESSIBLE SPH METHOD FOR FIXED BODY WAVE IMPACT SIMULATION | 670 |
| <i>Ningbo Zhang, Xing Zheng, Ye Miao, Xi-Peng Lv</i> | |
| TEST PARTICLE MONTE CARLO SIMULATION OF THE INTERACTION OF TWO PARALLEL FLAT PLATES IN FREE MOLECULAR FLOW REGIME | 675 |
| <i>Xuhong Jin, Fei Huang, Xiaoli Cheng</i> | |
| EFFECT OF GAP FLOW ON THE TORQUE FOR BLADES IN A RIM DRIVEN THRUSTER WITHOUT AXIAL PRESSURE GRADIENT | 680 |
| <i>Q. M. Cao, W. F. Zhao, D. H. Tang, F. W. Hong</i> | |
| A VELOCITY-PRESSURE COUPLING BASED CONSISTENT AND CONSERVATIVE METHOD FOR MHD FLOW | 686 |
| <i>Jun-Hua Pan, Ming-Jiu Ni, Nian-Mei Zhang</i> | |
| AN IMPROVED MOMENTUM-EXCHANGED IMMERSED BOUNDARY-BASED LATTICE BOLTZMANN METHOD FOR INCOMPRESSIBLE VISCOUS THERMAL FLOWS | 691 |
| <i>Mu-Feng Chen, Xiao-Dong Niu, Yi-Ren Ma, H. Yamaguchi, Y. Iwamoto</i> | |
| FOAM FLUID FLOW ANALYSIS IN HELICAL COILED TUBING USING CFD | 696 |
| <i>Fei Wang, Zhaomin Li, Hailong Chen, Songyan Li</i> | |
| NUMERICAL INVESTIGATION OF FILM COOLING USING RANS AND LES | 701 |
| <i>Shuo Li, Jiemin Zhan, Yejun Gong, Wenqing Hu</i> | |
| NUMERICAL SIMULATION OF THE EFFECT OF A CO-FLOW JET ON THE WIND TURBINE AIRFOIL AERODYNAMIC CHARACTERISTICS | 706 |
| <i>Heyong Xu, Shilong Xing, Zhengyin Ye</i> | |

MICROSCALE FLOWS AND MICRO/NANO FLUIDICS

| | |
|---|------------|
| BUBBLE TRANSLATION AT LOW-FREQUENCY ACTUATION IN A RESONATOR-SHAPED MICROFLUIDIC CHAMBER | 711 |
| <i>Xiaopeng Shang, Xiaoyang Huang, Chun Yang</i> | |
| INDUCED PRESSURE FIELDS OF POWER-LAW FLUIDS ELECTROSMOTIC FLOW IN MICRO-DIFFUSER AT DIFFERENT ANGLES | 716 |
| <i>Juan Duan, Qing-Yong Zhu</i> | |
| SHEATHLESS SEPARATION OF PARTICLES AND CELLS BY VISCOELASTIC EFFECTS IN STRAIGHT RECTANGULAR MICROCHANNELS | 721 |
| <i>Chao Liu, Chundong Xue, Guoqing Hu</i> | |
| ON THE SUCCESSFUL ENCAPSULATION OF WATER DROPLETS INTO OIL DROPLETS | 725 |
| <i>Xiaodong Chen, Yingnan Sun, Chundong Xue, Yude Yu, Guoqing Hu</i> | |
| INVESTIGATION OF GAS LOCAL EFFECTIVE VISCOSITY IN NANO-SCALE CHANNELS | 730 |
| <i>Shuangshuang Luo, Fubing Bao, Limin Qiu</i> | |
| EFFECT OF CONCENTRATION-DEPENDENT DISJOINING PRESSURE ON VERTICAL DRAINING FLOW | 735 |
| <i>Xuemin Ye, Yimei Qu, Chunxi Li</i> | |

| | |
|--|------------|
| NUMERICAL STUDY OF MIXED ELECTROSMOTIC/PRESSURE DRIVEN FLOW OF POWER-LAW FLUIDS IN T-SHAPED MICROCHANNELS | 740 |
| <i>Yijie Zhuang, Qingyong Zhu</i> | |
| Author Index | |