

Technical Program

Monday Afternoon (September 17)

10:20 - 11:10

Hardy Hall

Plenary Lecture 1

“Monitoring, load extension and detection of damage in hydraulic turbines. New challenges.”

Prof. Eduard Egusquiza (CDIF-UPC Barcelona, Spain)

13:00 - 15:00

RY202

Hydraulic Turbines①

Paper No. 6

“Very Large Eddy Simulation of the Swirling Flow in Draft Tube of Francis Turbine”

HUAN CHENG(Dongfang Electrical Machinery Co., Ltd., China) LING_JIU ZHOU(China Agricultural University, China) LING_JIU ZHOU(China Agricultural University, China)

Paper No. 7

“Numerical Study on the Flow in Balancing Hole”

Jun Matsui(Yokohama National University, Japan) Atsushi Okubo(Yokohama National University, Japan) Atsushi Okubo(Yokohama National University, Japan)

Paper No. 18

“Development of the pressure-time method as a relative method”

Pontus P. Jonsson(Vattenfall AB, Sweden) Georgiana Dunca(University POLITEHNICA of Bucharest, Romania) Georgiana Dunca(University POLITEHNICA of Bucharest, Romania)

Paper No. 20

“Investigating the influence of the jet from three nozzle and spear design configurations on Pelton runner performance by numerical simulation”

Sean Petley(Lancaster University, United Kingdom) Alexandros Panagiotopoulos(NTUA, Greece) Alexandros Panagiotopoulos(NTUA, Greece) Audrius Zidonis(Lancaster University, United Kingdom) George Aggidis(Lancaster University, United Kingdom) John Anagnostopoulos(NTUA, Greece) Dimitris Papantonis(NTUA, Greece)

Paper No. 21

“Transient CFD and experimental analysis for improved Pelton turbine casing designs”

Sean Petley(Lancaster University, United Kingdom) George Aggidis(Lancaster University, United Kingdom) George Aggidis(Lancaster University, United Kingdom)

Paper No. 23

“Dynamic measurements on a Kaplan turbine: model ? prototype comparison”

Mauricio Angulo(Faculty of Engineering - National University of La Plata, Argentina) Cecilia Lucino(Faculty of Engineering - National University of La Plata, Argentina) Cecilia Lucino(Faculty of Engineering - National University of La Plata, Argentina) Arturo Rivetti(Faculty of Engineering - National University of La Plata, Argentina) Sergio O. Liscia(Faculty of Engineering - National University of La Plata, Argentina)

RY203

Hydraulic Turbines②

Paper No. 382

“Influence of Guide Vane Clearance on Internal Flow of Medium Specific Speed Francis Turbine”

KISHORKUMAR GNANASEKARAN(EAML ENGINEERING CO., LTD., Japan) TADACHIKA TANAKA(EAML ENGINEERING CO., LTD., Japan) TADACHIKA TANAKA(EAML ENGINEERING CO., LTD., Japan) KAZUYOSHI MIYAGAWA(WASEDA UNIVERSITY, Japan) TOUI TANIWAKI(EAML ENGINEERING CO., LTD., Japan) WATARU TAKAHASHI(WASEDA UNIVERSITY, Japan)

Paper No. 384

“Performance variation study on bulb turbines with different water head under considering free surface and water gravity”

Yaping Zhao(Xi'an University of Technology, China) Weili Liao(Xi'an University of Technology, China) Weili Liao(Xi'an University of Technology, China) Xingqi Luo(Xi'an University of Technology, China) Zhihua Li(Xi'an University of Technology, China)

Paper No. 385

“Unusual Pressure Rise during the Load Rejection at a Deriaz Turbine”

Hiroaki Kikuta(Voith Fuji Hydro K.K., Japan) Kai Shimokawa(Voith Fuji Hydro K.K., Japan) Kai Shimokawa(Voith Fuji Hydro K.K., Japan) Tadashi Tsukamoto(Voith Fuji Hydro K.K., Japan) Shogo Nakamura(Voith Fuji Hydro K.K., Japan)

Paper No. 388

“A Runner Modernization in a Deriaz Turbine Hydropower Station”

Hiroaki Kikuta(Voith Fuji Hydro K.K., Japan) Ryoji Suzuki(Voith Fuji Hydro K.K., Japan) Ryoji Suzuki(Voith Fuji Hydro K.K., Japan) Danijel Anciger(Voith Hydro Holding GmbH & Co. KG, Germany)

Paper No. 390

“Design optimization of medium specific speed Francis turbines with unshrouded runners”

Wataru Takahashi(WASEDA University, Japan) Masafumi Shinji(WASEDA University, Japan) Masafumi Shinji(WASEDA University, Japan)
Kazuyoshi Miyagawa(WASEDA University, Japan) Yoshiichirou Hayashi(Chigasaki Research Institute, Japan)

Paper No. 394

“Fluid Exiting Force due to Flutter and Rotor, Stator Interactions of Axial Flow Turbines”

Kazushi Ajiro(WASEDA University, Japan) Kunimasa Matsuda(WASEDA University, Japan) Kunimasa Matsuda(WASEDA University, Japan)
Japan) Kazuyoshi Miyagawa(WASEDA University, Japan)

R204

Pumps①

Paper No. 47

“Three-Objective Optimization of a Single-Channel Pump for Wastewater Treatment”

Jin-Hyuk Kim(Korea Institute of Industrial Technology , Korea) Wang-Gi Song(University of Science & Technology , Korea) Wang-Gi Song(University of Science & Technology , Korea) Kyoung-Yong Lee(Korea Institute of Industrial Technology, Korea) Sang-Bum Ma(Inha University, Korea) Kwang-Yong Kim(Inha University, Korea)

Paper No. 54

“Influence of Impeller and Guide Vane Hub Size on Hydraulic Performance of Mixed-flow Pump”

Wenpeng Zhang(Yangzhou University, China) Fangping Tang(Yangzhou University, China) Fangping Tang(Yangzhou University, China) Ye Xia(Yangzhou University, China) Chenhui Wu(Yangzhou University, China) Haiyu Liu(Yangzhou University, China)

Paper No. 95

“The effect of balancing holes on performance of a centrifugal pump: Numerical and Experimental Investigations”

Mehrdad Raisee(University of Tehran, Iran) Mohammad Fathi(University of Tehran, Iran) Mohammad Fathi(University of Tehran, Iran)

Paper No. 115

“Wall Roughness Influence on the NPSH Characteristics of Centrifugal Pumps”

Andrej Lipej(University of Novo mesto, Slovenia) Simon Muhic(University of Novo mesto, Slovenia) Simon Muhic(University of Novo mesto, Slovenia)

Paper No. 170

“Artificial neural network for the performance improvement of a centrifugal pump”

WENJIE WANG(Jiangsu University, China) JI PEI(Jiangsu University, China) JI PEI(Jiangsu University, China) Xingcheng Gan(Jiangsu University, China) Tingyun Yin(Jiangsu University, China)

Paper No. 216

“Effect of Lean Mode of Blade Trailing Edge on Hydraulic Performance for Double-suction Centrifugal Pump”

Chaoyue Wang(College of water resources and civil engineering , China) Fujun Wang(Beijing Engineering Research Center of Safety and Energy Saving Technology for Water Supply Network System, China) Fujun Wang(Beijing Engineering Research Center of Safety and Energy Saving Technology for Water Supply Network System, China) Ruofu Xiao(College of water resources and civil engineering, China) Wei Yang(College of water resources and civil engineering, China)

R303

Hydraulic Systems①

Paper No. 3

“Transient Characteristics of a Centrifugal Pump at Rapid Startup”

Teiichi TANAKA(National Institute of Technology, Kumamoto College, Japan) Naoto Takatsu(National Institute of Technology, Kumamoto College, Japan) Naoto Takatsu(National Institute of Technology, Kumamoto College, Japan)

Paper No. 8

“Modification of the shell type trifurcation shape for penstock design in A hydraulic plant by numerical simulations”

Young-Joon Kim(K-water, Korea) Jung-Jae Hyun(K-water, Korea) Jung-Jae Hyun(K-water, Korea) Won-Guk Jang(K-water, Korea) Yong Cho(K-water, Korea) In-Jun Cho(K-water, Korea) Young-Il Kim(K-water, Korea) Tai-Young Cho(K-water, Korea)

Paper No. 14

“Effect of Throttling Orifice Head Loss on Dynamic Behavior of Hydro-turbine Governing System with Air Cushion Surge Chamber”

Wencheng Guo(Huazhong University of Science and Technology, China) James Yang(Royal Institute of Technology, Sweden) James Yang(Royal Institute of Technology, Sweden)

Paper No. 30

“Detection of Extended Blockages in Pressurised Pipelines using Hydraulic Transients with a Layer-Peeling Method”

Wei Zeng(University of Adelaide, Australia) Jinzhe Gong(University of Adelaide, Australia) Jinzhe Gong(University of Adelaide, Australia)

Angus Simpson(University of Adelaide, Australia) Benjamin Cazzolato(University of Adelaide, Australia) Aaron Zecchin(University of Adelaide, Australia)

Paper No. 34

“A New Method to Calculate Hydraulic Transients in HDPE Pipes Using the Standard Solid Model to Represent the HDPE Viscoelastic Behaviour”

RAFAEL B CARMONA-PAREDES(UNIVERSIDAD NACIONAL AUTONOMA DE MEXICO, Mexico) RENE AUTRIQUE(POLICONDUCTOS, Mexico) RENE AUTRIQUE(POLICONDUCTOS, Mexico) DAVID PANIAGUA-LOVERA(UNIVERSIDAD NACIONAL AUTONOMA DE MEXICO, Mexico)

Paper No. 42

“Numerical Analysis for Transient Process of Hydropower and Water-supply System Sharing a Headrace Tunnel”

Jiebin Yang(Wuhan University, China) Jiandong Yang(Wuhan University, China) Jiandong Yang(Wuhan University, China) Anting Ma(Wuhan University, China)

RY305

Cavi. & Multi. Flow①

Paper No. 109

“Numerical simulation of the cavitation micro-jet velocity and erosion on a plane-convex hydrofoil with semicylindrical obstacle”

Victor Hidalgo(Escuela Polit?cnica Nacional, Ecuador) Xianwu Luo(Tsinghua University, China) Xianwu Luo(Tsinghua University, China) Esteban Valencia(Escuela Polit?cnica Nacional, Ecuador) Patricio Cruz(Escuela Polit?cnica Nacional, Ecuador)

Paper No. 226

“Cavitation Erosion ? Corrosion Behavior of Some Hydraulic Turbine Runner Steels”

Laurent Ton-That(Hydro-Quebec, Canada) Robert Lacasse(Hydro-Quebec, Canada) Robert Lacasse(Hydro-Quebec, Canada)

Paper No. 280

“Statistical analysis of cavitation erosion impacts in a vibratory apparatus with copulas”

Gabriel Taillon(Waseda university, Japan) Kaoruko Onishi(Waseda university, Japan) Kaoruko Onishi(Waseda university, Japan) Kazuyoshi Miyagawa(Waseda University, Japan)

Paper No. 423

“Cavitation erosion resistance of high-strength fiber reinforced composite material”

Gabriel Taillon(Waseda University, Japan) Sumio Saito(Waseda University, Japan) Sumio Saito(Waseda University, Japan) Chiharu Kawakita(National Maritime Research Institute, Japan)

Paper No. 432

“Cavitation erosion testing of different cavitation-resistant materials and coatings using the cavitating jet method”

Pavel Rudolf(Brno University of Technology, Czech) Martin Julis(Brno University of Technology, Czech) Martin Julis(Brno University of Technology, Czech) Lenka Klakurkova(Brno University of Technology, Czech) Martin Hudec(Brno University of Technology, Czech)

RY306

WS:Energy Storage①

Keynote Speech

Prof. Gajic,

Prof. Lee,

Prof. Nourbakhsh

(TBD)

Monday Evening (September 17)

9:00 - 9:50

RY203

Plenary Lecture 2

“Understanding and progress on the unsteady problems due to rotor-stator interactions in hydraulic machines.”

Prof. Kazuyoshi Miyagawa (Waseda University, Japan)

15:20 - 17:40

RY202

Hydraulic Turbines③

Paper No. 50

“Preliminary Design and Performance Analysis of a Positive Displacement Hydraulic Turbine”

Arihant Sonawat(University of Science and Technology, Korea) Seung-Jun Kim(University of Science and Technology, Korea) Seung-Jun Kim(University of Science and Technology, Korea) Kyoung-Yong Lee(Korea Institute of Industrial Technology, Korea) Kyung min Kim(Korea District Heating Corporation, Korea) Yong-Kab Lee(Anflux Co., Ltd., Korea) Jin-Hyuk Kim(Korea Institute of Industrial Technology, Korea)

Paper No. 31

“Unsteady Simulation of Cavitating Turbulent Flow for Low Head Francis Turbine.”

Pankajkumar_Paragbhai Gohil(Sarvajanic College of Engineering and Technology, Surat, India) R_P Saini(Indian Institute of Technology, Roorkee, India) R_P Saini(Indian Institute of Technology, Roorkee, India)

Paper No. 49

“Pressure oscillation suppression by air admission in a Francis turbine draft tube”

Xianwu Luo(Tsinghua University, China) An Yu(Hohai University, China) An Yu(Hohai University, China) Lin Wang(Tsinghua University, China) Hongyuan Xu(Tsinghua University, China)

Paper No. 222

“PARAMETRIC OPTIMIZATION TO REDUCE EROSION IN A FRANCIS TURBINE RUNNER”

Esteban Valencia(Escuela Politecnica Nacional, Ecuador) Edwin Bone(Escuela Politecnica Nacional, Ecuador) Edwin Bone(Escuela Politecnica Nacional, Ecuador) Sergio Galv?n(Universidad Michoacana de S?n Nicol?s de Hidalgo, Mexico) Victor Hidalgo(Escuela Politecnica Nacional, Ecuador) Edgar Cando(Escuela Politecnica Nacional, Ecuador)

Paper No. 429

“Construction of the Reduced Order Dynamic Model for Swirling Flow Control in Hydraulic Turbine Draft Tube”

Pavel Rudolf(Brno University of Technology, Czech) Ondrej Urban(Brno University of Technology, Czech) Ondrej Urban(Brno University of Technology, Czech)

RY203

Hydraulic Turbines④

Paper No. 395

“Experimental Investigation on the Dynamic Response of Pelton Runners”

Monica Egusquiza(UPC, Spain) Carme Valero(UPC, Spain) Carme Valero(UPC, Spain) David Valentin(UPC, Spain) Eduard Egusquiza(UPC, Spain)

Paper No. 410

“Characterization of the Effects of Ingested Bodies on the RSI of Hydraulic Turbines”

Alfredo Guardo Zabaleta(Universitat Politècnica de Catalunya, Spain) Alfred Fontanals(Universitat Politècnica de Catalunya, Spain) Alfred Fontanals(Universitat Politècnica de Catalunya, Spain) Eduard Egusquiza(Universitat Politècnica de Catalunya, Spain)

Paper No. 61

“Numerical and Experimental Assessment of the Pulsating Water Jet in Conical Diffusers”

Constantin Tanasa(Politehnica University Timisoara, Romania) Raul Szakal(Politehnica University Timisoara, Romania) Raul Szakal(Politehnica University Timisoara, Romania) Sebastian Muntean(Romanian Academy-Timisoara Branch, Romania) Tiberiu Ciocan(Politehnica University Timisoara, Romania)

Paper No. 421

“Proposal of a New Hydraulic Turbine Capable of High Efficiency Operation over a Wide Range of Flow Rate and Effective Head”

Kazuyoshi MIYAGAWA(WASEDA University, Japan) Masafumi SHINJI(WASEDA University, Japan) Masafumi SHINJI(WASEDA University, Japan) Takayuki SUGIMOTO(TOHOKU SMALL HYDROPOWER CO.,LTD., Japan) Tsubasa NAGANUMA(TOHOKU SMALL HYDROPOWER CO.,LTD., Japan) Reijiro WAKU(TOHOKU SMALL HYDROPOWER CO.,LTD., Japan) Tatsuya IRIE(WASEDA University, Japan)

R Y204

Pumps②

Paper No. 250

“Experimental Study on the Optimal Range on Nozzle-to-throat Clearance of Jet Centrifugal Pump”

Qun Wang(Jiangsu University, China) Yang Wang(Jiangsu University, China) Yang Wang(Jiangsu University, China)

Paper No. 317

“Influence of posterior cavity structure on axial force and pressure distribution of stamping pump”

Wenqi Zhang(Zhejiang University of Technology, China) Zicheng Zhang(Zhejiang University of Technology, China) Zicheng Zhang(Zhejiang University of Technology, China)

Paper No. 407

“Flow losses analysis in a mixed flow pump with annular volute by entropy production evaluation”

JIAN CAO(Jiangsu University, China) Ji Pei(Jiangsu University, China) Ji Pei(Jiangsu University, China) Wenjie Wang(Jiangsu University, China) shouqi Yuan(Jiangsu University, China)

Paper No. 458

“Hydraulic optimization of impeller blade in reactor coolant pump base with Kriging model”

Daoxing Ye(Xihua University, China) Xide Lai(Xihua University, China) Xide Lai(Xihua University, China) Qianglei Wang(Xihua University, China)

Paper No. 274

“Effect of a Blade Thickness on the Hydraulic Performance of a Mixed-flow Pump Impeller”

Yong-In Kim(University of Science & Technology , Korea) Sung Kim(Korea Institute of Industrial Technology , Korea) Sung Kim(Korea Institute of Industrial Technology , Korea) Kyoung-Yong Lee(Korea Institute of Industrial Technology , Korea) Jin-Hyuk Kim(Korea Institute of Industrial Technology , Korea) Young-Seok Choi(Korea Institute of Industrial Technology , Korea)

R Y303

Hydraulic Systems②

Paper No. 44

**“Analysis of the Francis turbine upper-part-load pulsation
Part I ? Experimental results vs. hydro-acoustic model”**

Peter Doerfler(Hydro adviser LLC, Switzerland)

Paper No. 43

**“Analysis of the Francis turbine upper-part-load pulsation
Part II ? Mechanism of self-excitation ”**

Peter Doerfler(Hydro adviser LLC, Switzerland)

Paper No. 136

**“Influence of Impeller’s Elastic Deformation on the Stability of Balance Piston
Mechanism of Rocket Engine Turbopump”**

Hiromichi Hiraki(Nagoya University, Japan) Tsuyoshi Inoue(Nagoya University, Japan) Tsuyoshi Inoue(Nagoya University, Japan)

Paper No. 89

**“GPU Parallel Acceleration of Transient Simulations of Open Channel and
Pipeline Coupled System”**

Wan_wan Meng(Wuhan University, China) Yong_guang Cheng(Wuhan University, China) Yong_guang Cheng(Wuhan University, China)

Zhi_yan Yang(Wuhan University, China) shuai Shang(Zhangfeng Water Conservancy Management Company Ltd, China) feng

Yang(Construction Management Company for Chushandian Reservoir Project of Henan Province, 0)

Paper No. 104

**“Hydraulic transient challenges for the upgrade of FMHL+ pumped storage
power plant from 240MW to 420MW”**

Christophe Nicolet(Power Vision Engineering S?rl, Switzerland) Antoine B?guin(Power Vision Engineering S?rl, Switzerland) Antoine

B?guin(Power Vision Engineering S?rl, Switzerland) Ga?l Micoulet(ALPIQ Suisse SA, Switzerland)

Paper No. 124

“The Elastic Property of Water and Penstock's Effect on Governor Stability”

Torbj?rn K. Nielsen(NTNU, Norway) Bj?rnar Svingen(Hymatec and NTNU, Norway) Bj?rnar Svingen(Hymatec and NTNU, Norway)

Paper No. 68

**“Transient Hydraulic Calculations with a Linear Turbine Model derived from a
Nonlinear Synthetic Model”**

Bjornar Lona Svingen(NTNU / Hymatec Controls, Norway) Torbjorn K Nielsen(NTNU, Norway) Torbjorn K Nielsen(NTNU, Norway)

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Cavi. & Multi. Flow②

Paper No. 11

“Numerical simulation using the bubble size distribution model of cryogenic cavitation around an axial helical inducer”

Yu Ito(Tokyo Institute of Technology, Japan) Xiao Zheng(Tokyo Institute of Technology, Japan) Xiao Zheng(Tokyo Institute of Technology, Japan)

Paper No. 116

“The Simulation of Asymmetric Micro-Textures on the Lubrication Characteristics of Sliding Friction Pairs”

Dongni Liu(Dalian Maritime University, China) Zhijun Yan(Dalian Maritime University, China) Zhijun Yan(Dalian Maritime University, China) Xinhe Zhu(Dalian Maritime University, China) Dong Cheng(Dalian Maritime University, China) Xun Fang(Dalian Maritime University, China) Cheng Xue(Tsinghua University, China)

Paper No. 127

“Cavitation Aggressiveness on a Hydrofoil”

Jean-Bastien Carrat(LEGI, Univ. Grenoble Alpes, CNRS, France) Timo Bouvard(LEGI, Univ. Grenoble Alpes, CNRS, France) Timo Bouvard(LEGI, Univ. Grenoble Alpes, CNRS, France) Jean-Pierre Franc(LEGI, Univ. Grenoble Alpes, CNRS, France)

Paper No. 284

“From nucleation to cloud cavitation”

Peter F. Pelz(TU Darmstadt, Germany) Johannes Bottenbender(TU Darmstadt, Germany) Johannes Bottenbender(TU Darmstadt, Germany) Tim F. Gross(TU Darmstadt, Germany) Alexander Terwort(TU Darmstadt, Germany)

Paper No. 351

“Numerical investigation on flow field characteristics of Helmholtz Oscillator”

Zhenlong Fang(Wuhan University of Technology, China) Qiang Wu(Wuhan University of Technology, China) Qiang Wu(Wuhan University of Technology, China) Wei Wei(Wuhan University of Technology, China)

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WS:Energy Storage②

Paper No. 140

“Pressure Pulsations During a Fast Transition from Pump to Turbine Mode of Operation in Laboratory and Field experiment”

Magni F. Svarstad(Norwegian University of Science and Technology (NTNU), Norway) Torbjørn K. Nielsen(Norwegian University of Science and Technology (NTNU), Norway) Torbjørn K. Nielsen(Norwegian University of Science and Technology (NTNU), Norway)

Paper No. 209

“CFD simulation of transient startup for a low specific-speed pump-turbine”

Ernesto Casartelli(Hochschule Luzern, Technik & Architektur, Switzerland) Oliver Ryan(Hochschule Luzern, Technik & Architektur, Switzerland) Oliver Ryan(Hochschule Luzern, Technik & Architektur, Switzerland) Luca Mangani(Hochschule Luzern, Technik & Architektur, Switzerland)

Paper No. 29

“Transient Simulation of Model Pumped Storage Hydropower Plant during Load-Rejection Scenarios by using 1D-3D Simulation”

Chengcheng Yin(Wuhan University, China) Jiandong Yang(Wuhan University, China) Jiandong Yang(Wuhan University, China) Yongguang Cheng(Wuhan University, China)

Paper No. 292

“Transfer of transient conditions from prototype to closed-loop model test rig”

Johannes Junginger(University of Stuttgart, Germany) Stefan Riedelbauch(University of Stuttgart, Germany) Stefan Riedelbauch(University of Stuttgart, Germany)

Paper No. 72

“Effect of Cavitation Flow on the Transitions in a Pumped Storage Power Station”

Xiaolong Fu(Harbin Institute of Technology, China) Guodong Li(Harbin Institute of Technology, China) Guodong Li(Harbin Institute of Technology, China) Hongjie Wang(Harbin Institute of Technology, China) Guanghui Zhang(Harbin Institute of Technology, China) Wei Li(Harbin Institute of Technology, China) Xianzhu Wei(Harbin Institute of Technology, China)

Paper No. 342

“Hydraulic transient Simulation and Characteristic Investigation on Kaplan Type Hydroelectric Power Plant with Open Channel”

Sheng Chen(Hohai University, China) Jian Zhang(Hohai University, China) Jian Zhang(Hohai University, China)

Tuesday Morning (September 18)

9:00 - 9:50

RY203

Plenary Lecture 3

“Changes in hydro turbine design – The last 40 years, and into the future.”

Mr. Stuart Coulson (Voith Hydro, USA)

10:00 - 12:10

RY202

Hydraulic Turbines⑤

Paper No. 98

“Physical mechanisms of inter-blade vortex development inside blade channels at deep part load operation of Francis turbines”

Keita Yamamoto(EPFL, Switzerland) Andres Müller(Nippon Koei Co., Ltd., Japan) Andres Müller(Nippon Koei Co., Ltd., Japan) Christian Landry(Power Vision Engineering Sàrl, Switzerland) François Avellan(EPFL, Switzerland)

Paper No. 74

“Radial Dampers Impact on Shaft Vibrations at Resonance”

Rolf Gustavsson(Vattenfall AB, Sweden) Mattias Nesselqvist(Vattenfall AB, Sweden) Mattias Nesselqvist(Vattenfall AB, Sweden)

Paper No. 82

“Francis turbine with tandem runners: a proof of concept”

Romeo F. Susan-Resiga(Politehnica University Timisoara, Romania) Adrian Stuparu(Politehnica University Timisoara, Romania) Adrian Stuparu(Politehnica University Timisoara, Romania)

Paper No. 88

“Numerical Investigation of the Behavior of the Cavitation Rope in a Francis Turbine with Vortex-Control Grooves”

An YU(Hohai University, China) Daqing ZHOU(Hohai University, China) Daqing ZHOU(Hohai University, China)

Paper No. 90

“Development of Wide Operating Range Runner for Francis Turbine Upgrading”

Jiri Obrovsky(Litostroj Power - CKD Blansko Engineering, a.s., Czech) Josef Zouhar(Litostroj Power - CKD Blansko Engineering, a.s., Czech) Josef Zouhar(Litostroj Power - CKD Blansko Engineering, a.s., Czech) Ales Skotak(Litostroj Power - CKD Blansko Engineering, a.s., Czech)

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Hydraulic Turbines⑥

Paper No. 451

“An Experimental Investigation of Cavitation Surge in Draft tube of Francis Turbine”

Koichi Yonezawa(Central Research Institute of Electric Power Industry, Japan)

Paper No. 457

“Oscillation investigation of hydraulic generating unit induced by pressure fluctuation of draft tube vortex during load-up transient process”

Leike Zhang(Taiyuan University of Technology, China) Yi Xu(Shenyang Academy of Environmental Science, China) Yi Xu(Shenyang Academy of Environmental Science, China) Zhenyue Ma(Dalian University of Technology, China) Xueni Wang(Taiyuan University of Technology, China)

Paper No. 99

“Influence of Draft Tube Water Injection System on Cavitation Behaviour in a Full-Scale Francis Turbine with Visual Access”

Ingrid_K. Vilberg(Norwegian University of Science and Technology, Norway) Morten Kjeldsen(Flow Design Bureau AS, Norway) Morten Kjeldsen(Flow Design Bureau AS, Norway) Jarle_V. Ekanger(Flow Design Bureau AS, Norway) Torbjørn_K. Nielsen(Norwegian University of Science and Technology, Norway)

Paper No. 435

“Design and numerical development of an axial rotor to be prototyped and applied in experimental test bench”

Tiago Martins de Azevedo(Federal University of Itajuba, Brazil) Geraldo Lucio Tiago Filho(Federal University of Itajuba, Brazil) Geraldo Lucio Tiago Filho(Federal University of Itajuba, Brazil)

Paper No. 440

“Towards the simplified design of a multistage hydrokinetic turbine”

Geraldo Lucio Tiago Filho(Federal University of Itajuba, Brazil) Germán Alejandro Ibarra Bolaños(Universidad Antonio Nariño, Colombia) Germán Alejandro Ibarra Bolaños(Universidad Antonio Nariño, Colombia)

R Y204

Pumps③

Paper No. 19

“Unsteady Flow Characteristic Analysis of a Centrifugal Pump under Over-load Operating Conditions”

Xiaoran Zhao(Tsinghua University, China) Yexiang Xiao(Tsinghua University, China) Yexiang Xiao(Tsinghua University, China) Jin Zhang(Tsinghua University, China)

Paper No. 150

“A Theoretical, Numerical and Experimental Analysis of S-Shape Instabilities in Reversible Pump-Turbines: Resultant Strategies for Improving Operational Stability”

Markus Lenarcic(ANDRITZ AG, Austria) Arno Gehrler(ANDRITZ AG, Austria) Arno Gehrler(ANDRITZ AG, Austria)

Paper No. 362

“Suppression of the unstable head curve in mixed flow pump with adjustable vane by use of shallow grooves”

Shusaku KAGAWA(EBARA CORPORATION, Japan) Takaki SAKURAI(EBARA CORPORATION, Japan) Takaki SAKURAI(EBARA CORPORATION, Japan)

Paper No. 315

“Analysis of blade-passage flow of a mixed-flow pump at performance-curve instability”

Isao Hagiya(Hitachi, Ltd., Research and Development Group, Japan) Chisachi Kato(Institute of Industrial Science, The University of Tokyo, Japan) Chisachi Kato(Institute of Industrial Science, The University of Tokyo, Japan) Masashi Fukaya(Hitachi, Ltd., Research and Development Group, Japan) Takahide Nagahara(Hitachi, Ltd., Industrial Products Company, Japan)

Paper No. 391

“Influence of forward rake and skew blade angle on positive slope characteristics of mixed flow pumps”

Naruki Nitta(WASEDA University, Japan) Hitoshi Kanno(WASEDA University, Japan) Hitoshi Kanno(WASEDA University, Japan) Kazuyoshi Miyagawa(WASEDA University, Japan) Yasushi Shinozuka(DMW Corporation, Japan) Kotaro Kado(DMW Corporation, Japan) Shigeyuki Tomimatsu(DMW Corporation, Japan)

Paper No. 22

“Development and Validation of a One-Dimensional Transient Rotodynamic Pump Model at Component Scale.”

Laura Matteo(CEA, Universit? Paris-Saclay, France) Antoine Dazin(LMFL, France) Antoine Dazin(LMFL, France)

RY303

Hydraulic Systems③

Paper No. 183

“Behavior of Francis turbines at part load. Field assessment in prototype: Effects on the hydraulic system”

Carme Valero(Polytechnic University of Catalonia, Spain) Mónica Egusquiza(Polytechnic University of Catalonia, Spain) Mónica Egusquiza(Polytechnic University of Catalonia, Spain) Alexandre Presas(Polytechnic University of Catalonia, Spain) Eduard Egusquiza(Polytechnic University of Catalonia, Spain)

Paper No. 223

“Modeling and reducing fuel flow pulsation of a fuel-metering system during pump mode switching in a turbo fan engine”

Seiei MASUDA(IHI Corporation, Japan) Fumio SHIMIZU(Kyushu Institute of Technology, Japan) Fumio SHIMIZU(Kyushu Institute of Technology, Japan) Masaki FUCHIWAKI(Kyushu Institute of Technology, Japan)

Paper No. 262

“The unitary aqueduct method: a new tool for the preliminary design of air chambers”

René Autrique(Policonductos, Mexico, Mexico) Eduardo Rodal(Instituto de Ingeniería, UNAM, Mexico, Mexico) Eduardo Rodal(Instituto de Ingeniería, UNAM, Mexico, Mexico)

Paper No. 373

“Empirical findings on the transmission of draft tube instabilities along the penstocks of hydraulic plants”

Jean HERAUD(EDF, France) Bruno LECOMTE(EDF, France) Bruno LECOMTE(EDF, France) Pierre Yves LOWYS(GE RENEWABLE HYDRO, France) Goran PAVIC(INSA Lyon, France)

Paper No. 318

“Practical experiences with water hammer control in Slovenian hydropower plants”

Jernej Mazij(Litostroj Power d.o.o., Slovenia) Anton Bergant(Litostroj Power d.o.o., Slovenia) Anton Bergant(Litostroj Power d.o.o., Slovenia)

Paper No. 288

“Effect of combination vacuum relief and air release valve on hydraulic transients during pipeline filling process”

Ling Wang(Tsinghua University, China) Zhengwei Wang(Tsinghua University, China) Zhengwei Wang(Tsinghua University, China)

RY305

Cavi. & Multi. Flow③

Paper No. 307

“Experimental Study of Interactions between a Laser Induced Cavitation Bubble and a Particle”

Feipeng Chen(North China Electric Power University, China) Yuning Zhang(North China Electric Power University, China) Yuning Zhang(North China Electric Power University, China) Yuning Zhang(China University of Petroleum-Beijing, China)

Paper No. 360

“The role of added mass in the dispersion of bubble clouds”

stephane etienne(Polytechnique Montr?al, Canada) Sarra Zoghiami(Polytechnique Montr?al, Canada) Sarra Zoghiami(Polytechnique Montr?al, Canada) David Scott(GE Renewable Energy, Canada) Laurent Bornard(GE Renewable Energy, Canada)

Paper No. 386

“Numerical Analysis of Liquid Droplet Impingement on Rough Material Surface with Water Pool”

Hirotoishi SASAKI(Institute of Fluid Science, Tohoku University, Japan) Yuka IGA(Institute of Fluid Science, Tohoku University, Japan) Yuka IGA(Institute of Fluid Science, Tohoku University, Japan)

Paper No. 261

“Flow characteristics of water delivery piping system and its effective flow area at discharge branches”

Fumio SHIMIZU(Kyushu Institute of Technology, Japan) Masatoshi AKINAGA(Kyushu Institute of Technology, Japan) Masatoshi AKINAGA(Kyushu Institute of Technology, Japan) Kazuhiro TANAKA(Kyushu Institute of Technology, Japan)

Paper No. 328

“The Effect of Turbulence on the Dynamics of Two Bubbles in Hydrodynamic Cavitation”

Liang Lv(China University of Petroleum-Beijing, China) Yongxue Zhang(China University of Petroleum-Beijing, China) Yongxue Zhang(China University of Petroleum-Beijing, China)

RY306

WS:Energy Storage③

Paper No. 269

“Development trends in the field of reversible pump-turbines ? Study of pumping and generating mode off-design conditions”

Uro? Je?e(Litostroj Power, Slovenia) Vojtech Novotny(Litostroj Power, Czech) Vojtech Novotny(Litostroj Power, Czech)

Paper No. 308

“Experimental Study of a Prototype Reversible Pump Turbine during Low Partial Load Condition in Generating Mode”

Yuning Zhang(North China Electric Power University, China) Xianghao Zheng(North China Electric Power University, China) Xianghao Zheng(North China Electric Power University, China) Jinwei Li(China Institute of Water Resources and Hydropower Research, China) Yuning Zhang(China University of Petroleum-Beijing, China) Xiaoze Du(North China Electric Power University, China)

Paper No. 132

“Experimental and Numerical Investigation of the Speed-no-Load Instability of a Low Specific Speed Pump-Turbine with focus on the Influence of Turbulence Models”

SABRI DENIZ(Lucerne University of Applied Sciences, Switzerland) ERNESTO CASARTELLI(Lucerne University of Applied Sciences, Switzerland) ERNESTO CASARTELLI(Lucerne University of Applied Sciences, Switzerland)

Paper No. 321

“Model experiments and study on regulating stability of isolated hydropower plants”

Weijia Yang(Wuhan University, China) Jiandong Yang(Wuhan University, China) Jiandong Yang(Wuhan University, China) Anting Ma(Wuhan University, China) Liangyu Hou(Wuhan University, China)

Paper No. 438

“Experimental and Numerical Investigations of a High-Head Pumped-Storage Power Plant at Speed No Load”

Jean Decaix(University of Applied Sciences and Arts Western Switzerland Valais, Switzerland) Vlad Hasmatuchi(University of Applied Sciences and Arts Western Switzerland Valais, Switzerland) Vlad Hasmatuchi(University of Applied Sciences and Arts Western Switzerland Valais, Switzerland) Pedro A. Manso(Ecole Polytechnique F?d?rale de Lausanne , Switzerland) Fran?ois Avellan(Ecole Polytechnique F?d?rale de Lausanne , Switzerland) C?cile M?nch(University of Applied Sciences and Arts Western Switzerland Valais, Switzerland) Laurent Rapillard(University of Applied Sciences and Arts Western Switzerland Valais, Switzerland)

Paper No. 103

“Rotor-stator interaction in a pump-turbine operating in synchronous condenser mode”

Elena Vagnoni(EPFL, Switzerland) Lo?c Andolfatto(EPFL, Switzerland) Lo?c Andolfatto(EPFL, Switzerland) Pierre Leroy(GE, France) Fran?ois Avellan(EPFL, Switzerland)

Tuesday Afternoon (September 18)

13:30 - 15:30

RY202

Hydraulic Turbines⑦

Paper No. 106

“Vibration fault diagnosis based on Multi-scale EMD time-series similarity mining for hydroturbine”

yangang xue(0, 0)

Paper No. 134

“Solution of a kind of negative flow in Pelton turbine”

Ruzhi Gong(Harbin Institute of Technology, China) Chao Ying Shang(Harbin Institute of Technology, China) Chao Ying Shang(Harbin Institute of Technology, China) Deyou Li(Harbin Institute of Technology, China) Yikui Zhou(Harbin Institute of Technology, China) Xianzhu Wei(State Key Laboratory of Hydro-Power Equipment, Harbin Institute of Large Electrical Machinery, 0)

Paper No. 114

“Formation of Rotating Vortex Rope in the Francis-99 Draft Tube”

Nahaleh Sotoudeh(Tarbiat Modares University, Iran) Reza Maddahian(Tarbiat Modares University, Iran) Reza Maddahian(Tarbiat Modares University, Iran)

Paper No. 118

“Physic of Bad-behaved Flow in Pelton Turbine through Dynamic Simulation”

Lei HAN(Harbin Institute of Technology, China) Gaofu Zhang(Harbin Institute of Technology, China) Gaofu Zhang(Harbin Institute of Technology, China) Hongda Wei(Harbin Institute of Technology, China) Wei Li(Harbin Institute of large electrical machinery, China)

Paper No. 130

“Numerical methodology to predict and analyze cavitating flows in a Kaplan turbine”

Flavia Turi(Univ. Grenoble Alpes, Grenoble INP, France) Regiane Fortes-Patella(Univ. Grenoble Alpes, Grenoble INP, France) Regiane Fortes-Patella(Univ. Grenoble Alpes, Grenoble INP, France)

Paper No. 108

“On the runner cone perforation in Francis hydro-turbine”

Younging Xu(Shenyang Institute of Engineering, China) Wentao Su(Harbin Institute of Technology, China) Wentao Su(Harbin Institute of Technology, China)

R Y203

PAT①

Paper No. 449

“Characteristics and Internal Flow of a Low Specific Speed Pump used as a Turbine”

Zhihao LIU(WASEDA University , Japan) Kazuyoshi MIYAGAWA(WSEDA University, Japan) Kazuyoshi MIYAGAWA(WSEDA University, Japan) Roshanak FAHIMI(University of Tehran, Iran) Mojtaba TAHANI(University of Tehran, Iran)

Paper No. 414

“Numerical Analysis on the Impeller Blade Load of Hydraulic Turbine under Gas-Liquid Two Phase Condition”

Fengxia Shi(lanzhou university of technology, China) Renhui Zhang(0, 0) Yanlei Guo(0, 0) Sushi Yue(0, 0)

Paper No. 357

“Optimisation of a pump-as-turbine runner using a 3D inverse design methodology”

Peng Wang(Advanced Design Technology, United Kingdom) Maira Vera-Morales(Advanced Design Technology, United Kingdom) Maira Vera-Morales(Advanced Design Technology, United Kingdom) Mehrdad Zangeneh(University College London, United Kingdom) Baoshan Zhu(Tsinghua University, China) Zhe Ma(Tsinghua University, China)

Paper No. 403

“Numerical Simulation of Two-phase Flow in an Energy Recovery Micro-Hydraulic Turbine Based on Francis Hydraulic Model”

Shuaihui SUN(Xi'an University of Technology, China) Ye PANG(Xi'an University of Technology, China) Ye PANG(Xi'an University of Technology, China) Xiaobo ZHENG(Xi'an University of Technology, China) Jianguo YAN(Xi'an University of Technology, China) Denghui HE(Xi'an University of Technology, China) Xingqi LUO(Xi'an University of Technology, China)

Paper No. 341

“Investigating the effect of the type and diameter of volute on the efficiency of centrifugal reverse pump at different operating conditions”

Mojtaba Tahani(University of Tehran, Iran) Roshanak Fahimi(University of Tehran, Iran) Roshanak Fahimi(University of Tehran, Iran) Younes Noorollahi(University of Tehran, Iran) Kazuyoshi Miyagawa(Waseda University, Japan) Majid Najafpour(Iran University of Science and Technology, Iran) Majid Mehrnia(University of Tehran, Iran) Salman Sareman(Islamic Azad University, Iran)

Paper No. 346

“Experimental investigation on renewable energy extraction in water distribution

network for power injection to the national electricity grid in Tehran”

Mojtaba Tahani(University of Tehran, Iran) Fatemeh Razi Astaraei(University of Tehran, Iran) Fatemeh Razi Astaraei(University of Tehran, Iran) Kazuyoshi Miyagawa(Waseda University, Japan) Roshanak Fahimi(University of Tehran, Iran) Mehdi Malekzadeh(University of Tehran, Iran) Majid Najafpour(Iran University of Science and Technology, Tehran, Iran, Iran)

R Y204

Pumps④

Paper No. 38

“Response of Backflow to Flow Rate and Pressure Fluctuations in Centrifugal Pump”

Wenzhe Kang(China Agricultural University, China) Lingjiu Zhou(China Agricultural University, China) Lingjiu Zhou(China Agricultural University, China) Wei Wang(China Agricultural University, China)

Paper No. 53

“Study on pressure pulsation characteristics of Two-way pumping system with super low head and large flow”

Weixuan Jiao(Yangzhou University, China) Li Cheng(Yangzhou University, China) Li Cheng(Yangzhou University, China) Di Zhang(Yangzhou University, China)

Paper No. 87

“Influence of impeller vane arrangement on energy performance and pressure fluctuation of a double-suction centrifugal pump”

Yu SONG(0, 0) Yongyao LUO(0, 0) Yongyao LUO(0, 0)

Paper No. 208

“Experimental study on radiation noise characteristics of multistage centrifugal pump under variable speed conditions”

J P Yuan(National Research Center of Pumps in Jiangsu University. China, China) K L Huang(National Research Center of Pumps in Jiangsu University. China, China) K L Huang(National Research Center of Pumps in Jiangsu University. China, China) B L Zhou(National Research Center of Pumps in Jiangsu University. China, China) G C Sheng(National Research Center of Pumps in Jiangsu University. China, China) Y F Tang(National Research Center of Pumps in Jiangsu University. China, China)

Paper No. 240

“Pressure pulsation characteristics of the cascade and its impact on flow-induced noise”

Hui Quan(LanZhou University of Technology, China) RenNian Li(LanZhou University of Technology, China) RenNian Li(LanZhou University of Technology, China) BaiHeng Fu(LanZhou University of Technology, China) ShiFang Yuan(LanZhou University of Technology, China) Yi

Chai(LanZhou University of Technology, China) XiaoYu Chai(LanZhou University of Technology, China)

Paper No. 289

“Linear and Nonlinear Stability Analysis of Rotating Stall in a Wide Vaneless Diffuser”

Yaguang HENG(Xihua University, China) Antoine DAZIN(?cole nationale sup?rieure d'arts et m?tiers, France) Antoine DAZIN(?cole nationale sup?rieure d'arts et m?tiers, France) G?rard BOIS(?cole nationale sup?rieure d'arts et m?tiers, France)

RY303

General

Topics①

Paper No. 408

“Numerical Investigating Flow Characteristic of Swirling Turbulent Round Jet”

Bo Yuan(Chongqing University, China) Shuai Jia(Chongqing University, China) Shuai Jia(Chongqing University, China) Quanling Wang(Chongqing University, China) Jiaxuan Li(Chongqing University, China) Jiarui Li(Chongqing University, China)

Paper No. 300

“Simulation Research on the Damping Direct Injection Method of Hydro Turbine Generating Unit Under Multi-machine Condition”

Jing Qian(Kunming University of Science and Technology, China) Yun Zeng(Kunming University of Science and Technology, China) Yun Zeng(Kunming University of Science and Technology, China) Zhiming Ma(Kunming University of Science and Technology, China)

Paper No. 301

“Parameters Design and Simulation Research of Water Pressure Phase Compensation Link in Governor Side of HydroTurbine Generating Unit”

Yun Zeng(Kunming university of science and technology, China) Jing Qian(Kunming University of Science and Technology, China) Jing Qian(Kunming University of Science and Technology, China) Guangbo Yang(Kunming University of Science and Technology, China) Zhengkai Zhang(Kunming University of Science and Technology, China) Fangfang Wang(Kunming University of Science and Technology, China) jikun Zhang(Kunming University of Science and Technology, China)

Paper No. 258

“Investigation of Flattened Torque Converter Performance at Low Speed Ratio”

Yuki Ohta(Shinshu University, Japan)

RY305

Cavi. & Multi. Flow④

Paper No. 355

“Experimental study on the effect of bubble cluster shape on cavitation in water hydraulic valve”

Haihang Wang(Harbin Engineering University, China) He Xu(Harbin Engineering University, China) He Xu(Harbin Engineering University, China) Liye Jiao(Harbin Engineering University, China) Mingyu Hu(Harbin Engineering University, China)

Paper No. 361

“Characterization of bubble cloud quality and evolution using optical probes”

Julien Bouvard(Polytechnique Montr?al, Canada) C?dric B?guin(Polytechnique Montr?al, Canada) C?dric B?guin(Polytechnique Montr?al, Canada) David Scott(GE Renewable Energy, Canada) Laurent Bornard(GE Renewable Energy, Canada)

Paper No. 16

“Experimental and Computational Capture of High Frequency Oscillation Induced by Inception Cavitation in Submerged Shear Layer”

Yuchuan Wang(Northwest A &F University, China) Lei Tan(Tsinghua University, China) Lei Tan(Tsinghua University, China) Diyi Chen(Northwest A &F University, China)

Paper No. 331

“Numerical simulation of unsteady cloud cavitation: a comparative study of compressible mixture models”

Guoyi Peng(College of Engineering, Nihon University, Japan) Macoto Mori(Graduate school of Engineering, Nihon Univ., Japan) Macoto Mori(Graduate school of Engineering, Nihon Univ., Japan) Yausuyuki Oguma(College of Engineering, Nihon Univ., Japan)

Paper No. 173

“Cavitation CFD Analyses Considering the Pressure Wave Propagation within the Piping Systems”

Motohiko Nohmi(EBARA Corporation, Japan) Shusaku Kagawa(EBARA Corporation, Japan) Shusaku Kagawa(EBARA Corporation, Japan) Tomoki Tsuneda(EBARA Corporation, Japan) Donghyuk Kang(Saitama University, Japan) Kazuhiko Yokota(Aoyama Gakuin University, Japan)

Paper No. 225

“ASSESSMENT OF CAVITATION REGIME IN DIVERGENT ROTATING FLOWS”

Florentina Bunea(National Institute for Research and Development in Electrical Engineering ICPE-CA, Romania) Gabriel Ciocan(Laval University, Canada) Gabriel Ciocan(Laval University, Canada)

RY306

WS:Energy Storage④

Paper No. 110

“Renovation of the Pumped-Storage System from Fixed Speed to Adjustable Speed at Okutataragi Power Station”

Hiroyuki Tanaka(Kansai Electric Power Company, Incorporated, Japan)

Paper No. 70

“Short-term Hydro Scheduling of a Variable Speed Pumped Storage Hydropower Plant Considering Head Loss in a Shared Tunnel”

Jiehong Kong(SINTEF Energy Research, Norway) Hans Ivar Skjelbred(SINTEF Energy Research, Norway) Hans Ivar Skjelbred(SINTEF Energy Research, Norway)

Paper No. 322

“Modelling and simulation of flexible power control of variable-speed pumped storage plants using MATLAB/Simulink”

Weijia Yang(Wuhan University, China) Jiandong Yang(Wuhan University, China) Jiandong Yang(Wuhan University, China)

Paper No. 259

“Study on Intense Vibration of Local Structures of Some Pumped-storage Powerhouse”

Jin_wei Li(China Institute of Water Resources and Hydropower Research, China) Zhen_fu Gu(Hebei Zhanghewan Pumped Storage Power Generation Co. Ltd., China) Zhen_fu Gu(Hebei Zhanghewan Pumped Storage Power Generation Co. Ltd., China) Ji_xing Yu(China Institute of Water Resources and Hydropower Research, China) Jin_hui Ouyang(China Institute of Water Resources and Hydropower Research, China)

Paper No. 312

“Super Grid Prospects in North-East Asia”

Young Ho LEE(Korea Maritime & Ocean University(KMOU), Korea)

Tuesday Evening (September 18)

15:50 - 17:30

RY202

Hydraulic Turbines⑧

Paper No. 139

“Investigations of rotating stall inception in a propeller turbine runner operating in low-load conditions”

Sebastien Houde(Laval University, Canada) Claire Deschenes(Laval University, Canada) Claire Deschenes(Laval University, Canada) Yvan Maciel(Laval University, Canada)

Paper No. 146

“Reduced scale model testing for prediction of natural frequencies and hydro-acoustic resonances in hydropower plants operating in off-design conditions”

Arthur Favrel(Ecole Polytechnique F?d?rale de Lausanne, Switzerland) Joao Gomes Pereira Junior(Ecole Polytechnique F?d?rale de Lausanne, Switzerland) Joao Gomes Pereira Junior(Ecole Polytechnique F?d?rale de Lausanne, Switzerland) S?bastien Allign?(Power Vision Engineering S?rl, Switzerland) Christophe Nicolet(Power Vision Engineering S?rl, Switzerland) Fran?ois Avellan(Ecole Polytechnique F?d?rale de Lausanne, Switzerland)

Paper No. 149

“Numerical study of the flow dynamics at no load operation for a high head Francis turbine at model scale.”

M?lissa Fortin(Laval University, Canada) Bernd Nennemann(Andritz Hydro Canada Inc., Canada) Bernd Nennemann(Andritz Hydro Canada Inc., Canada) Claire Desch?nes(Laval University, Canada)

Paper No. 151

“Hydraulic turbine start-up: a fluid-structure simulation methodology”

Matthieu Melot(Universit? Laval, Canada) Bernd Nennemann(Andritz Hydro Canada Inc., Canada) Bernd Nennemann(Andritz Hydro Canada Inc., Canada) Claire Desch?nes(Universit? Laval, Canada) Maxime Coulaud(Universit? Laval, Canada)

Paper No. 152

“Financial analysis for optimization of hydropower plants regarding hydro-abrasive erosion: A study from Indian Himalayas”

Anant Kumar Rai(Indian Institute of Technology Roorkee, India) Arun Kumar(Indian Institute of Technology Roorkee, India) Arun Kumar(Indian Institute of Technology Roorkee, India)

R Y203

PAT②

Paper No. 324

“Numerical Investigation of Tongue Effects on Pump Performance in Direct and Reverse Modes”

Hamed Alemi(Hydraulic Machinery Research Institute, Iran) Mohammad Fathi(Hydraulic Machinery Research Institute, Iran) Mohammad Fathi(Hydraulic Machinery Research Institute, Iran) Seyed Ahmad Nourbakhsh(Hydraulic Machinery Research Institute, Iran)

Paper No. 325

“A Novel Volute Design for Reducing Radial Force in Pump and PAT Modes”

Hamed Alemi(Hydraulic Machinery Research Institute, Iran) Mohammad Fathi(Hydraulic Machinery Research Institute, Iran) Mohammad Fathi(Hydraulic Machinery Research Institute, Iran) Seyed Ahmad Nourbakhsh(Hydraulic Machinery Research Institute, Iran)

Paper No. 224

“Hydraulic Machinery Four-Quadrant Performance Curves Dependent on Specific Speed and Applied in Transient Calculations”

Zdravko P Giljen(PhD student, Senior engineer for mechanical works, Montenegro Electric Company, Vuka Karadzica Street no 2, Nikšić, Montenegro) Milos S Nedeljkovic(University of Belgrade, Faculty of Mechanical Engineering, Kraljice Marije 16, 11120 Beograd, Serbia) Milos S Nedeljkovic(University of Belgrade, Faculty of Mechanical Engineering, Kraljice Marije 16, 11120 Beograd, Serbia)

Paper No. 165

“Optimum Design of Low Head Francis Runner to Enhance Performance against Sediment Erosion”

Ujjwal Shrestha(Mokpo National University, Korea) Zhenmu Chen(Mokpo National University, Korea) Zhenmu Chen(Mokpo National University, Korea)

R Y204

Pumps⑤

Paper No. 26

“Multistage Canned Motor Pump ? Getting Deep Insights with CFD ? Simulation, Optimisation and Validation”

Markus Mosshammer(Graz University of Technology, Austria) Helmut Benigni(Graz University of Technology, Austria) Helmut Benigni(Graz University of Technology, Austria) Stefan Kraemer(HERMETIC-Pumpen GmbH, Germany) Christian Dahlke(HERMETIC-Pumpen GmbH, Germany)

Paper No. 39

“Numerical simulation of suction and discharge valves’ motion in reciprocating waterflooding pump”

Yi Ma(Zhejiang University of Technology, China) He Zhang(Ningbo Tongli Pump Industry Co., Ltd, China) He Zhang(Ningbo Tongli Pump Industry Co., Ltd, China) Yingfeng Chen(Ningbo Heli Mechanical Pump Co., Ltd, China) Qiang Wang(Zhejiang University of Technology, China)

Paper No. 85

“Investigation of tip leakage vortex characteristics around tip clearance in a mixed-flow pump”

Yabin LIU(0, 0) Lei TAN(0, 0) Lei TAN(0, 0)

Paper No. 368

“Fully-Resolved Large Eddy Simulation of Transitional Flow in Inter-Stage Bush of a Centrifugal Pump”

Romain Prunier(Hitachi, Ltd., Japan) Chisachi Kato(The University of Tokyo, Japan) Chisachi Kato(The University of Tokyo, Japan) Takahide Nagahara(Hitachi, Ltd., Japan)

Paper No. 369

“Influence of Clearance Flow on Disk Friction Loss in Low Specific Speed Hydraulic Machines

”

Ryutaro Ujii(Waseda University, Japan) Asuma Ichinose(Waseda University, Japan) Asuma Ichinose(Waseda University, Japan) Kazuyoshi Miyagawa(Waseda University, Japan) Takeshi Sano(Mitsubishi Heavy Industries, LTD, Japan)

RY303

General

Topics②

Paper No. 133

“Study of flow structure in erosion prone complex geometries”

Eirik Volent(Norwegian University of Science and Technology, Norway) Ole Gunnar Dahlhaug(Norwegian University of Science and Technology, Norway) Ole Gunnar Dahlhaug(Norwegian University of Science and Technology, Norway)

Paper No. 327

“On the Extension of Acoustic Flow Metering Devices to Monitoring of Transient Phenomena”

Ion CANDEL(Universit? Grenoble Alpes, France) Cornel IOANA(Universit? Grenoble Alpes, France) Cornel IOANA(Universit? Grenoble

Alpes, France) Carmen BADINA(Electricite de France, Division Technique Generale, France)

Paper No. 200

“Effect of Groove Configurations on the Swirling Intensity of Supersonic Separator”

JaeSung Lee(Sungkyunkwan University, Korea) HyeonJae Noh(Sungkyunkwan University, Korea) HyeonJae Noh(Sungkyunkwan University, Korea)

RY305

Cavi. & Multi. Flow⑤

Paper No. 171

“A Simplified Thermodynamic Effect Model for Cavitating Flow in Hot Water”

Anh Dinh Le(0, Japan) Yuka Iga(Institute of Fluid Science, Japan) Yuka Iga(Institute of Fluid Science, Japan)

Paper No. 297

“Numerical investigation of thermal cavitating flows in fluoroketone over a NACA 0015 hydrofoil”

Shaofeng Zhang(Zhejiang Sci-Tech University, China) Xiaojun Li(Zhejiang Sci-Tech University, China) Xiaojun Li(Zhejiang Sci-Tech University, China) Zhe Lin(Zhejiang Sci-Tech University, China)

Paper No. 383

“Performance of V-Cone Flowmeter Applied to Cryogenic Fluid Measurement Considering Cavitation”

Denghui He(Xi'an University of Technology, China) Bofeng Bai(Xi'an Jiaotong University, China) Bofeng Bai(Xi'an Jiaotong University, China) Jie Zhang(Xi'an University of Technology, China) Xingqi Luo(Xi'an University of Technology, China)

Paper No. 314

“Development of gaseous cavitation model in hydraulic oil flow considering the effect of dynamic stimulation.”

Yosuke Ibata(Tohoku University, Japan) Yudai Matsuura(Tohoku University, Japan) Yudai Matsuura(Tohoku University, Japan) Yuka Iga(Tohoku University, Japan)

Paper No. 283

“Modelling of a converging/diverging tube using CATHARE-3 two-phase flow system code for sodium cavitation studies.”

Laura Matteo(CEA, Universit? Paris-Saclay, France) G?d?on Mauger(CEA, Universit? Paris-Saclay, France) G?d?on Mauger(CEA, Universit? Paris-Saclay, France)

Paper No. 168

“Effect of Suction Pipe Inlet Condition on the Occurrence of Vortex in Pump Sump”

Ming Guo(Mokpo National University, Korea) Zhenmu Chen(Mokpo National University, Korea) Zhenmu Chen(Mokpo National University, Korea)

RY306

WS:Energy Storage⑤

Seminar

”Rules to Hydraulic Transient Design Analysis”

Prof. Gajic

Wednesday Morning (September 19)

10:10 - 12:10

RY202

Hydraulic Turbines⑨

Paper No. 153

“Fluid-structure simulations of the stochastic behavior of a medium head Francis turbine during startup”

Jean-François Morissette(Hydro-Québec, Canada) Jonathan Nicolle(Hydro-Québec, Canada) Jonathan Nicolle(Hydro-Québec, Canada)

Paper No. 156

“Evaluation on Sediment Erosion of Pelton Turbine Flow passage component”

Juan LIU(China institute of water resources and hydropower research, China) Jiangcheng YU(China institute of water resources and hydropower research, China) Jiangcheng YU(China institute of water resources and hydropower research, China)

Paper No. 162

“Experimental Investigation of a High Head Francis Turbine Model During Shutdown Operation”

Rahul Goyal (Grenoble-INP, France) Bhupendra K Gandhi (Indian Institute of Technology Roorkee, India) Bhupendra K Gandhi (Indian Institute of Technology Roorkee, India)

Paper No. 58

“Hardware in the Loop Testing of Electronic Hydro Governor for Francis Turbine”

Rama Gopal Potturi Potturi(BHEL R&D, India) Sarma SVR(BHEL R&D, India) Sarma SVR(BHEL R&D, India) Krishna Prasad BR(BHEL, Electronics Division, India)

Paper No. 166

“Optimum design of J-Groove for a bulb turbine model to suppress swirl flow in the draft tube”

Viet Luyen Vu(Mokpo National University, Korea) Zhenmu Chen(Mokpo National University, Korea) Zhenmu Chen(Mokpo National University, Korea)

Paper No. 164

“Pressure Fluctuation Test and Vortex Observation in Francis Turbines Draft

Tube”

Lei Zhu(China Institute of Water Resources and Hydropower Research, China) Xiaochao Meng(China Institute of Water Resources and Hydropower Research, China) Xiaochao Meng(China Institute of Water Resources and Hydropower Research, China) Ying Chen(China Institute of Water Resources and Hydropower Research, China) Haiping Zhang(China Institute of Water Resources and Hydropower Research, China) Wanpeng Wang(China Institute of Water Resources and Hydropower Research, China) Li Lu(China Institute of Water Resources and Hydropower Research, China)

R Y203

Sustainable Hydro.①

Paper No. 15

“Experimental assessing the effect of decompression on Crucian Carps injury during turbine passage and the optimization methods”

Long Meng(China Institute of Water Resources and Hydropower Research, China) Wanpeng Wang(China Institute of Water Resources and Hydropower Research, China) Wanpeng Wang(China Institute of Water Resources and Hydropower Research, China) Lice Zhao(China Institute of Water Resources and Hydropower Research, China) Tiejou Li(China Institute of Water Resources and Hydropower Research, China) Haiping Zhang(China Institute of Water Resources and Hydropower Research, China) Bingquan Ma(China Institute of Water Resources and Hydropower Research, China)

Paper No. 126

“Study on High Pressure Design of Contra-Rotating Small Hydroturbine”

Takuji Hosotani(Tokushima University, Japan) Toru Shigemitsu(Tokushima University, Japan) Toru Shigemitsu(Tokushima University, Japan) Tomofumi Ikebuchi(Tokushima University, Japan)

Paper No. 66

“Numerical Investigation of Performance and Flow Patterns of a Modified Savonius Hydraulic Rotor”

Yongchao Zhang(Jiangsu University, China) Can Kang(Jiangsu University, China) Can Kang(Jiangsu University, China) Wisdom Opape(Takoradi Technical University, Ghana)

Paper No. 69

“Experimental Analysis of the Operation of a Small Francis Turbine Equipped with an Innovative Aeration Device”

Diana_M Bucur(University POLITEHNICA of Bucharest, Romania) Georgiana Dunca(University POLITEHNICA of Bucharest, Romania) Georgiana Dunca(University POLITEHNICA of Bucharest, Romania) Gabriel_D Ciocan(Universit? Laval, Canada)

Paper No. 71

“A Comparison of Linear Interpolation and Spline Interpolation for Turbine Efficiency Curves in Short-term Hydropower Scheduling Problems”

Hans Ivar Skjelbred(SINTEF Energy Research, Norway) Jiehong Kong(SINTEF Energy Research, Norway) Jiehong Kong(SINTEF Energy Research, Norway)

Paper No. 77

“Role of Turbine Testing Lab for overcoming the challenges related to hydropower development in Nepal”

Hari Prasad Neopane(Kathmandu University, Nepal) Sailesh Chitrakar(Kathmandu University, Nepal) Sailesh Chitrakar(Kathmandu University, Nepal)

RY204

Pumps⑥

Paper No. 393

“Design Optimization of a Low specific speed Centrifugal Pump with an Unshrouded Impeller for Cryogenic Liquid Flow”

Tomoyuki Hayashi(Waseda University, Japan) Yohei Nakamura(Waseda University, Japan) Yohei Nakamura(Waseda University, Japan)

Paper No. 131

“Experimental Analysis of a Pump Equipped with an Axial Rotor with Variable Speed”

Alin Bosioc(Politehnica University Timisoara, Romania) Daniel Mos(Politehnica University Timisoara, Romania) Daniel Mos(Politehnica University Timisoara, Romania) Sebastian Muntean(Romanian Academy - Timisoara Branch, Romania) Liviu Anton(Politehnica University Timisoara, Romania)

Paper No. 147

“Failure analysis of the rainwater axial pumps installed in a wastewater pumping station”

Sebastian Muntean(Romanian Academy - Timisoara Branch, Romania) Alin Bosioc(Politehnica University of Timisoara, Romania) Alin Bosioc(Politehnica University of Timisoara, Romania) Sergiu Galatanu(Politehnica University of Timisoara, Romania) Ionel Aurel Draghici(AQUATIM S.A. Timisoara, Romania) Liviu Eugen Anton(Politehnica University of Timisoara, Romania)

Paper No. 286

“Research on Hydraulic Characteristics of Twin Screw Pump”

Di Zhang(Yangzhou University, China) Li Cheng(Yangzhou University, China) Li Cheng(Yangzhou University, China) Weixuan Jiao(Yangzhou University, China)

Paper No. 202

“PIV Measurement of Internal Flow in Mini Centrifugal Pump”

Toru Shigemitsu(Tokushima University, Japan) Yuya Ogawa(Tokushima University, 0) Yuya Ogawa(Tokushima University, 0)

Paper No. 238

“Flow Control of Low Specific Speed Constant Head Pump with Based on Splitter Blade Technology”

Weijun Wang(Jiangsu University-Zhenjiang Research Institute of Fluid Engineering Equipment Technology, Zhenjiang, Jiangsu, China, China) Yang Wang(Jiangsu University, China) Yang Wang(Jiangsu University, China) Bin Sun (Jiangsu University-Zhenjiang Research Institute of Fluid Engineering Equipment Technology, Zhenjiang, Jiangsu, China, 0) Rong Lu (Jiangsu University-Zhenjiang Research Institute of Fluid Engineering Equipment Technology, Zhenjiang, Jiangsu, China, 0) Min Liu (Jiangsu University-Zhenjiang Research Institute of Fluid Engineering Equipment Technology, Zhenjiang, Jiangsu, China, 0)

R303

Comp. & Exp.①

Paper No. 41

“Numerical and Experimental Investigation of Erosion Induced Leakage Flow through Guide Vanes of Francis Turbine”

Sailesh Chitrakar(Kathmandu University, Nepal) Hari Prasad Neopane(Kathmandu University, Nepal) Hari Prasad Neopane(Kathmandu University, Nepal)

Paper No. 17

“Reducing Computational Effort Of High Head Francis Turbines”

Ken-Robert G. Jakobsen(EDRMedeso AS, Norway) Erik Tengs(EDRMedeso AS/Norwegian University of Science and Technology, Norway) Erik Tengs(EDRMedeso AS/Norwegian University of Science and Technology, Norway)

Paper No. 46

“Numerical Investigation of Tip Leakage Vortex Cavitation in Blade of Axial Turbines”

Mehrdad Raisee(University of Tehran, Iran) Seyed Ahmad Nourbakhsh(University of Tehran, Iran) Seyed Ahmad Nourbakhsh(University of Tehran, Iran)

Paper No. 93

“A benchmark test case for swirling flows: design of the swirl apparatus, experimental data, and numerical challenges”

Romeo F. Susan-Resiga(Politehnica University Timisoara, Romania) Constantin Popescu(Politehnica University Timisoara, Romania)

Constantin Popescu(Politehnica University Timisoara, Romania) Sebastian Muntean(Romanian Academy - Timisoara Branch, Romania)
Adrian Stuparu(Politehnica University Timisoara, Romania)

Paper No. 100

“Correlation Between Numerical Simulations and Measurements to Assess Uncertainties: A Case Study on a Hydroelectric Runner”

Martin Gagnon(Institut de recherche d'Hydro-Qu?bec (IREQ), Canada) Ariane Immarigeon(Hydro-Qu?bec, Canada) Ariane Immarigeon(Hydro-Qu?bec, Canada) Jean-Fran?ois Morissette(Institut de recherche d'Hydro-Qu?bec (IREQ), Canada)

RY305

Cavi. & Multi. Flow⑥

Paper No. 313

“The gap size effect on leakage flow and cavitation in the clearance of a 2D hydrofoil: high-speed visualization and velocity measurements”

Konstantin_S. Pervunin(Kutateladze Institute of Thermophysics SB RAS, Russia) Mikhail_V. Timoshevskiy(Kutateladze Institute of Thermophysics SB RAS, Russia) Mikhail_V. Timoshevskiy(Kutateladze Institute of Thermophysics SB RAS, Russia) Dmitriy_M. Markovich(Kutateladze Institute of Thermophysics SB RAS, Russia) Georgy_A. Semenov(PJSC "Power Machines" (LMZ), Russia) Aleksandr_V. Zakharov(PJSC "Power Machines" (LMZ), Russia)

Paper No. 396

“Unsteady forces and moments acting on a cantilevered rectangular hydrofoil with tip clearance in cavitating conditions”

Yushin Ehara(Kyushu University, Japan) Soichiro Kitamura(Kyushu University, Japan) Soichiro Kitamura(Kyushu University, Japan) Satoshi Watanabe(Kyushu University, Japan) Shin-ichi Tsuda(Kyushu University, Japan)

Paper No. 452

“On the hysteresis of incipience and desinence of tip vortex cavitation”

Ali Amini(EPFL, Switzerland) Martino Reclari(MHI, Japan) Martino Reclari(MHI, Japan) Mohamed Farhat(EPFL, Switzerland)

Paper No. 117

“Numerical investigation into cavitating flow around a NACA66 hydrofoil with advanced turbulence models”

Longgang Sun(Xi'an University of Technology, China) Pengcheng Guo(Xi'an University of Technology, China) Pengcheng Guo(Xi'an University of Technology, China) Xiaobo Zheng(Xi'an University of Technology, China) Jianguo Yan(Xi'an University of Technology, China) Jianjun Feng(Xi'an University of Technology, China)

Paper No. 400

“Flow Field and Cavitation Characteristics of Hydrofoils Coated with Hydrophilic and Hydrophobic Polymers

”

Taisei Mineshima(Waseda University, Japan) Kaoruko Onishi(Waseda University, Japan) Kaoruko Onishi(Waseda University, Japan)

Paper No. 453

“Boundary layer instability control around a hydrofoil in the unsteady cloud cavitating flow”

Bettar O. el Moctar(University of Duisburg-Essen, Germany) Ebrahim Kadivar(University of Duisburg-Essen, Germany) Ebrahim Kadivar(University of Duisburg-Essen, Germany)

R Y306

Ocean Hydro①

Paper No. 160

“A Study of Counter-rotating Impulse Turbine for Wave Energy Conversion - Effect of Middle Vane on the Performance -

”

Manabu Takao(National Institute of Technology, Matsue College, Japan) Kohei Yamada(Shinko Techno Engineering Co., Ltd., Japan) Kohei Yamada(Shinko Techno Engineering Co., Ltd., Japan) Ashraful Alam(National Institute of Technology, Matsue College, Japan) Shinya Okuhara(National Institute of Technology, Matsue College, Japan) Yoichi Kinoue(Saga University, Japan)

Paper No. 161

“Performance Comparison of Turbines for Bi-directional Flow”

Manabu Takao(National Institute of Technology, Matsue College, Japan) Seisuke Fukuma(National Institute of Technology, Matsue College, Japan) Seisuke Fukuma(National Institute of Technology, Matsue College, Japan) Ashraful Alam(National Institute of Technology, Matsue College, Japan) Yoichi Kinoue(Saga University, Japan) Toshiaki Setoguchi(Saga University, Japan)

Paper No. 167

“A Study on the Design and Performance Analysis on a Small Pump-turbine System for Ocean Renewable Energy Storage System”

Ujjwal Shrestha(Mokpo National University, Korea) Patrick_Mark Singh(Fiji National University, Fiji) Patrick_Mark Singh(Fiji National University, Fiji)

Paper No. 251

“Performance of Counter-Rotating Tandem Propellers at Oblique Flow Conditions”

Nak-Joong Lee(Kyushu Institute of Technology, Japan) Morihito Inagaki(JSE Co., LTD, Japan) Morihito Inagaki(JSE Co., LTD, Japan)

Paper No. 217

“Counter-Rotating Type Tidal Stream Power Unit: Excellent Performance Verified at Offshore Test”

Isao Samura(Kyowa Engineering Consultants Co., Ltd., Japan) Kazuo Kuwano (Kyowa Engineering Consultants Co., Ltd., Japan) Kazuo Kuwano (Kyowa Engineering Consultants Co., Ltd., Japan) Taizo Oda(EIM Electric Co., Ltd., Japan) Takumi Imakyurei(EIM Electric Co., Ltd., Japan) Hideyuki Inoue(Eagle Industry Co., Ltd, Japan) Yuuichiro Tokunaga(Eagle Industry Co., Ltd, Japan) Toshiaki Kanemoto(Saga University, Kyushu Institute of Technology, Japan) Kazuyoshi Miyagawa(Waseda University, Japan) Toshihiko Miwa(Maeda Corporation, Japan) Hiroshi Yamanokuchi(Maeda Corporation, Japan)

Paper No. 245

“Optimization of Marine Current Turbines, Using Meta Heuristic Algorithms”

Mojtaba Tahani(University of Tehran, Iran) Narek Babayan(University of Tehran, Iran) Narek Babayan(University of Tehran, Iran) Kazuyoshi Miyagawa(Waseda University, Japan) Mohammad Hossein Khozaei(University of Tehran, Iran) Sima Adimi(University of Tehran, Iran)

Wednesday Afternoon (September 19)

13:10 - 15:10

RY202

Hydraulic Turbines^⑩

Paper No. 176

“Optimisation of Pelton Turbine Jet Deflector Using CDF Analysis”

Boro Popovski(University Ss Cyril and Methodius, Macedonia) Andrej Lipej(Faculty of Technologies and Systems, Slovenia) Andrej Lipej(Faculty of Technologies and Systems, Slovenia) Zoran Markov(University Ss Cyril and Methodius, Macedonia)

Paper No. 179

“Experimental and Numerical Analysis of Turbulent Velocity Fluctuations in a Francis Turbine Draft Tube in Part Load Operation”

Axel Frey(Institute of Fluid Mechanics and Hydraulic Machinery, University of Stuttgart, Germany) Oliver Kirschner(Institute of Fluid Mechanics and Hydraulic Machinery, University of Stuttgart, Germany) Oliver Kirschner(Institute of Fluid Mechanics and Hydraulic Machinery, University of Stuttgart, Germany) Roland Jester-Zuerker(Voith Hydro Holding GmbH & Co. KG, Germany) Alexander Jung(Voith Hydro Holding GmbH & Co. KG, Germany)

Paper No. 190

“CFD-based Casing and Distributor Hydraulic Design Optimization”

Christophe Devals(?cole Polytechnique de Montr?al, Canada) Nigel Murry(Andritz Hydro Canada Inc, Canada) Nigel Murry(Andritz Hydro Canada Inc, Canada) Julien Dompierre(?cole Polytechnique de Montr?al, Canada) Luca Mangani(Lucerne University of Applied Sciences and Arts, Switzerland) Francois Guibault(?cole Polytechnique de Montr?al, Canada)

Paper No. 193

“MICRO-ENERGY HARVESTING BASED ON VORTEX INDUCED VIBRATION OF CROSS-FLOW TURBINE WITH VARIOUS CANTILEVER BEAM CONFIGURATIONS”

HyeonJae Noh(Sungkyunkwan University, Korea) JaeSung Lee(Sungkyunkwan University, Korea) JaeSung Lee(Sungkyunkwan University, Korea)

Paper No. 194

“Multilevel Design Optimization of Hydraulic Turbines based on Hierarchical Metamodel-Assisted Evolutionary Algorithms”

Evgenia Kontoleonos(ANDRITZ HYDRO GmbH, Austria) Markella Zormpa(National Technical University of Athens, Greece) Markella Zormpa(National Technical University of Athens, Greece) David Mack-Sahl(ANDRITZ HYDRO GmbH, Austria) Simon Weissenberger(ANDRITZ HYDRO GmbH, Austria)

Paper No. 196

“Refurbishment of twin Francis Turbines ? Maximising the annual Production”

Helmut Benigni(University of Technology, Graz, Austria) J?rgen Schiffer(University of Technology, Graz, Austria) J?rgen Schiffer(University of Technology, Graz, Austria)

RY203

Sustainable Hydro.②

Paper No. 159

“Performance of a Submerged Impulse Hydro Turbine”

Takuto Azegami(Graduate School of Shinshu University, Japan) Yusuke Katayama(Kyushu University, Japan) Yusuke Katayama(Kyushu University, Japan) Shouichiro Iio(Shinshu University, Japan)

Paper No. 174

“Design of a New Kaplan Pico-Turbine Runner Blades”

Ludovic Favre(University of Applied Sciences of Western Switzerland, Switzerland) Nicolas El Hayek(University of Applied Sciences of Western Switzerland, Switzerland) Nicolas El Hayek(University of Applied Sciences of Western Switzerland, Switzerland) Elena-Lavinia Niederh?user(University of Applied Sciences of Western Switzerland, Switzerland) Laurent Donato(University of Applied Sciences of Western Switzerland, Switzerland)

Paper No. 205

“Particle-based Evaluations of Fish-friendliness in Kaplan Turbine Operations”

Pedro Romero-Gomez(Andritz HYDRO GmbH, Austria) Monika Lang(Andritz HYDRO GmbH, Austria) Monika Lang(Andritz HYDRO GmbH, Austria) Simon Weissenberger(Andritz HYDRO GmbH, Austria)

Paper No. 215

“Torque Loss Occurring on a Submerged Impulse Hydro Turbine”

Saki Usami(Graduate School of Shinshu University, Japan) Hiroki Koyama(Graduate School of Shinshu University, Japan) Hiroki Koyama(Graduate School of Shinshu University, Japan) Yusuke Katayama(Kyushu university, Japan) Yoshiaki Haneda(National Institute of Technology, Nagano College, Japan) shouichiro Iio(Shinshu university, Japan)

Paper No. 268

“Design and Performance Evaluation of a Substitution Solution for Spiral Casing of Pico-Hydroelectric Plants”

Ludovic Favre(University of Applied Sciences of Western Switzerland, Switzerland) Nicolas El Hayek(University of Applied Sciences of Western Switzerland, Switzerland) Nicolas El Hayek(University of Applied Sciences of Western Switzerland, Switzerland) Elena-Lavinia Niederh?user(University of Applied Sciences of Western Switzerland, Switzerland) Laurent Donato(University of Applied Sciences of Western Switzerland, Switzerland)

Paper No. 277

“Effect of Guidevane on the Characteristics of a Propeller-Type Hollow Micro-Hydraulic Turbine with Excellent Performance in Passing Foreign Matter”

Tomomi Uchiyama(Nagoya University, Japan) Tomohiro Degawa(Nagoya University, Japan) Tomohiro Degawa(Nagoya University, Japan)
Takuji Kawai(Ricoh Company, Ltd., Japan) Kenichi Uehara(Ricoh Company, Ltd., Japan) Yoichi Maekawa(Ricoh Company, Ltd., Japan)

R204

Pumps⑦

Paper No. 1

“Numerical study of air-entraining and submerged vortices in pump sump”

Shinichiro Yanase(Okayama University, Japan) Ryo Yamasaki(Tsurumi Manufacturing Co., Japan) Ryo Yamasaki(Tsurumi Manufacturing Co., Japan) Yasunori Nagata(Okayama University, Japan) Shunji Higuchi(Tsurumi Manufacturing Co., Japan) Toshihiko Kawabe(Tsurumi Manufacturing Co., Japan) Toshihiro Takami(Okayama University of Science, Japan)

Paper No. 28

“Influence of the inlet vortex on axial flow pump unit”

Jie-Xi Song(Yangzhou University, China) Chao Liu(Yangzhou University, China) Chao Liu(Yangzhou University, China)

Paper No. 36

“The Numerical Optimization and Model Test of Axial Flow Pump Device with Elbow Inlet Flow Channel”

Chuanliu Xie(Yangzhou University, China) Fangping Tang(Yangzhou University, China) Fangping Tang(Yangzhou University, China)
Wenpeng zhang(Yangzhou University, China) Jiren Zhou(Yangzhou University, China) Haiyu Liu(Yangzhou University, China)

Paper No. 40

“An Experimental Study on Air Entrainment in a Suction Sump in Over-Critical-Submergence Condition”

Akira Morita(Doshisha University, Japan) Katsuya Hirata(Doshisha University, Japan) Katsuya Hirata(Doshisha University, Japan)
Tsuyoshi Maeda(Doshisha University, Japan) Takashi Noguchi(Kyoto University, Japan)

Paper No. 102

“Experimental Investigation of a Pumping Station from CET Powerplant Timisoara”

Adrian Stuparu(Politehnica University Timisoara, Romania) Alexandru Baya(Politehnica University Timisoara, Romania) Alexandru Baya(Politehnica University Timisoara, Romania) Liviu Anton(Politehnica University Timisoara, Romania) Daniel Mos(Politehnica University Timisoara, Romania)

Paper No. 122

“Numerical Simulation of Vortices Behavior in a Pump Sump”

Young Ho Lee(Korea Maritime and Ocean University, Korea) Ayham Amin Al habashna(Korea Maritime and Ocean University, Korea)
Ayham Amin Al habashna(Korea Maritime and Ocean University, Korea) Byung Ha Kim(Korea Maritime and Ocean University, Korea)

RY303

Comp. & Exp. ②

Paper No. 107

“Numerical investigation of the jet velocity profile and its influence on the Pelton turbine performance”

Takashi Kumashiro(Hitachi Mitsubishi Hydro Corporation, Japan) Siamak Alimirzazadeh(Ecole polytechnique f?d?rale de Lausanne, Switzerland) Siamak Alimirzazadeh(Ecole polytechnique f?d?rale de Lausanne, Switzerland) Ebrahim Jahanbakhsh(Ecole polytechnique f?d?rale de Lausanne, Switzerland) Sebastian Leguizam?n(Ecole polytechnique f?d?rale de Lausanne, Switzerland) Francois Avellan(Ecole polytechnique f?d?rale de Lausanne, Switzerland) Kiyohito Tani(Hitachi Mitsubishi Hydro Corporation, Japan)

Paper No. 111

“Field Test for Hydraulic Turbine Discharge and Efficiency Based on Current-meter Method”

Dengfeng Cao(China Institute of Water Resources and Hydropower Research, China) Luoping Pan(China Institute of Water Resources and Hydropower Research, China) Luoping Pan(China Institute of Water Resources and Hydropower Research, China)

Paper No. 113

“Signature analysis of characteristic frequencies in a high head Francis turbine”

Chirag Trivedi(Norwegian University of Science and Technology, Norway) Einar Agnalt(Norwegian University of Science and Technology, Norway) Einar Agnalt(Norwegian University of Science and Technology, Norway) Bard_Aslak Brandastro(Norwegian University of Science and Technology, Norway)

Paper No. 145

“Experimental investigation and numerical simulation of flow in the draft tube elbow of a Francis turbine over its entire operating range”

Masashi Sakamoto(Nippon Koei Co., Ltd., Japan) Andres M?ller(Nippon Koei Co., Ltd., Japan) Andres M?ller(Nippon Koei Co., Ltd., Japan) Takashi Hashii(Nippon Koei Co., Ltd., Japan) Kazuhiko Yamaishi(Nippon Koei Co., Ltd., Japan) Francois Avellan(Ecole polytechnique f?d?rale de Lausanne, Switzerland)

Paper No. 154

“Numerical simulation of a bulb turbine with an eddy-preserving limiter scheme”

Liu Yang(McGill University, Canada) Yao Jiang(McGill University, Canada) Yao Jiang(McGill University, Canada)

Paper No. 155

“Numerical investigation of draft tube flows using SAS turbulence model and a low-dissipation scheme.”

Yao Jiang(McGill University, Canada) Liu Yang(McGill University, Canada) Liu Yang(McGill University, Canada)

RY305

Cavi. & Multi. Flow⑦

Paper No. 129

“Interphase Characteristic Analysis in the whole flow passage of a Multiphase Rotodynamic Pump”

Wenwu Zhang(Beijing Institute of Technology, China) Zhiyi Yu(Beijing Institute of Technology, China) Zhiyi Yu(Beijing Institute of Technology, China)

Paper No. 177

“Analysis of Bubble Distribution Characteristics in a Multiphase Rotodynamic Pump”

Yong_Jiang Li(Beijing Institute of Technology, China) Zhi_Yi Yu(Beijing Institute of Technology, China) Zhi_Yi Yu(Beijing Institute of Technology, China)

Paper No. 246

“Numerical research of the particles erosion within the double suction centrifugal pump”

Haifeng Li(KSB Shanghai Pump Co., LTD., China) zaibing Pan(KSB Shanghai Pump Co., LTD., China) zaibing Pan(KSB Shanghai Pump Co., LTD., China)

Paper No. 445

“Investigation of internal flow pattern of a multiphase axial pump”

Takeshi Sano(Mitsubishi Heavy Industries, Ltd., Japan) Yun Xu(Tsinghua university, China) Yun Xu(Tsinghua university, China) Martino Reclari(Mitsubishi Heavy Industries, Ltd., Japan) Shu-liang Cao(Tsinghua university, China)

Paper No. 447

“CFD Simulation of the Inlet Gas Void Fraction Effect on Multistage Electrical

Submersible Pump.”

Sina YAN(Xi'an University of Technology, China) Xingqi LUO(Xi'an University of Technology, China) Xingqi LUO(Xi'an University of Technology, China) Jianjun Feng(Xi'an University of Technology, China) Guojun ZHU(Xi'an University of Technology, China) Senlin CHEN(Xi'an University of Technology, China) Denghui HE(Xi'an University of Technology, China) Chenhao LI(Xi'an University of Technology, China)

Paper No. 235

“Study on the influence of cavitation on the performance of nuclear main pump”

Shuyan Zhang(Lanzhou University of Technology, China) Xiaorui Cheng(Lanzhou University of Technology, China) Xiaorui Cheng(Lanzhou University of Technology, China)

RY306

Ocean Hydro②

Paper No. 275

“Reduction of Aerodynamic Noise radiated from Wells Turbine”

Yuji Tujimoto(Oita University, Japan) Masato Shibata(Oita University, Japan) Masato Shibata(Oita University, Japan) Hiromitsu Hamakawa(Oita University, Japan) Hidechito Hayashi(Nagasaki University, Japan) Eru Kurihara(Oita University, Japan)

Paper No. 310

“Performance of Fluidic Diode for a Twin Unidirectional Impulse Turbine”

Shinya Okuhara(National Institute of Technology, Matsue College, Japan) Masato Itoga(The Chugoku Electric Power Co., Inc., Japan) Masato Itoga(The Chugoku Electric Power Co., Inc., Japan) Manabu Takao(National Institute of Technology, Matsue College, Japan) Yoichi Kinoue(Saga University, Japan)

Paper No. 285

“Numerical Study of a Sinusoidal Transverse Propeller”

guillaume fasse(Arts et Metiers PARISTECH, France) annie-claude bayeul-lain?(Arts et Metiers PARISTECH, France) annie-claude bayeul-lain?(Arts et Metiers PARISTECH, France) arnaud curutchet(ADV TECH, France) benoit paillard(ADV TECH, France) Fr?d?ric Hauville(Ecole Navale, France)

Paper No. 439

“STUDY OF A ROTOR WELLS TYPE WITH DISTRIBUTOR APPLIED TO ULTRA-LOW FALL HYDROELECTRIC POWER PLANTS”

Almir Luiz Rodrigues(Federal University of Itajuba, Brazil) Geraldo Lucio Tiago Filho(Federal University of Itajuba, Brazil) Geraldo Lucio Tiago Filho(Federal University of Itajuba, Brazil)

Paper No. 303

“A Pump System with Wave Powered Impulse Turbine”

Yoichi Kinoue(Saga University, Japan) Norimasa Shiomi(Saga University, Japan) Norimasa Shiomi(Saga University, Japan) Hideaki Maeda(Torishima Pump Mfg. Co., Ltd., Japan) M. M. A. Alam(National Institute of Technology, Japan) Shinya Okuhara(National Institute of Technology, Japan) Manabu Takao(National Institute of Technology, Japan)

Paper No. 304

“Effect of Hub-to-Tip Ratio on the Performance of Bi-Directional Impulse Turbine with Flow Collector for Tidal Energy Conversion”

Yoichi Kinoue(Saga University, Japan) Norimasa Shiomi(Saga University, Japan) Norimasa Shiomi(Saga University, Japan) Tengen Murakami(Saga University, Japan) Yasutaka Imai(Saga University, Japan) Shuichi Nagata(Saga University, Japan)

Wednesday Evening (September 19)

15:30 - 17:10

RY202

Hydraulic Turbines①

Paper No. 198

“Investigation of the BulbT conical diffuser flow dynamics with TR-PIV and pressure measurements”

Jean-David Buron(University of Laval, Canada) S?bastien Houde(University of Laval, Canada) S?bastien Houde(University of Laval, Canada)

Paper No. 199

“Sensitivity of the Winter-Kennedy method to inlet and runner blade angle change on a Kaplan turbine”

Binaya Baidar(Lule? University of Technology, Sweden) Jonathan Nicolle(Institut de recherche d'Hydro-Qu?bec, Canada) Jonathan Nicolle(Institut de recherche d'Hydro-Qu?bec, Canada) Michel J. Cervantes(Lule? University of Technology; Norwegian University of Science and Technology, Sweden)

Paper No. 218

“Pressure Pulsations and Fatigue Loads in High Head Francis Turbines”

Bj?rn Winther Solemslie(Norwegian University of Science and Technology, Norway) Einar Agnalt(Norwegian University of Science and Technology, Norway) Einar Agnalt(Norwegian University of Science and Technology, Norway) Ole Gunnar Dahlhaug(Norwegian University of Science and Technology, Norway)

Paper No. 220

“Onboard measurements of pressure pulsations in a high head Francis model runner

”

Einar Agnalt(NTNU, Norway) Bj?rn W Solemslie(NTNU, Norway) Bj?rn W Solemslie(NTNU, Norway)

RY203

Sustainable Hydro.③

Paper No. 405

“A Study on Performance Prediction of Darrieus-type Hydroturbine Operated in Open Channels Using CFD with Actuator Disk Method”

Yoshitaka Suzuki(Kyushu University, Japan) Yusuke Katayama(Kyushu University, Japan) Yusuke Katayama(Kyushu University, Japan)

Shin-ichi Tsuda(Kyushu University, Japan) Akinori Furukawa(Oita National College of Technology, Japan)

Paper No. 298

“Experiment on Basic Performance of a Simple Waterwheel/Windmill with a Cross-Stream Axis”

Hironobu Sato(Doshisha University, Japan) Tomohiro Tokiwa(Doshisha University, Japan) Tomohiro Tokiwa(Doshisha University, Japan)

Takashi Noguchi(Kyoto University, Japan) Katsuya Hirata(Doshisha University, Japan)

RY204

Pumps⑧

Paper No. 210

“Origin and formation process of a submerged vortex in a pump sump”

Yoshinobu Yamade(Mizuho Information & Research Institute, Inc., Japan) Chisachi Kato(the University of Tokyo, Japan) Chisachi Kato(the

University of Tokyo, Japan) Jun Matsui(Yokohama National University, Japan)

Paper No. 249

“Experimental study of subsurface vortices at pump intake with an improved diversion-cone”

Zilong Zhao(0, China) Zhongdong Qian(0, China) Zhongdong Qian(0, China) Pengfei Wu(0, China)

Paper No. 273

“Evaluation Strategy of Particle Swarm Optimization and It's Application in Pumping Station System Optimal Operation”

Fangling Zhao(Yangzhou University, China) Xiaoli Feng(Yangzhou University, China) Xiaoli Feng(Yangzhou University, China)

Paper No. 291

“LES Simulation of Air-Core Vortex in Intake Flow Field of Pumping Station”

Dan Zi(China Agricultural University, China) Lian Shen(University of Minnesota, United States) Lian Shen(University of Minnesota, United

States)

Paper No. 84

“Influence of prewhirl angle on a centrifugal pump with inlet guide vane running in turbine mode”

Ming LIU (0, 0) Lei TAN(0, 0) Lei TAN(0, 0)

R303

Comp. & Exp.③

Paper No. 172

“PIV Measurements of the Flow in the Guide Vane Channels of a High Head Pump-turbine”

Peng Xue(China Institute of Water Resources and Hydropower Research, China) ZhiPing Liu(China Institute of Water Resources and Hydropower Research, China) ZhiPing Liu(China Institute of Water Resources and Hydropower Research, China) YaJuan Tian(China Institute of Water Resources and Hydropower Research, 0) Xin Wang(0, 0) Rui Chen(0, 0)

Paper No. 178

“The design of 25kw class hydraulic turbine generator by using CAE.”

Won Hyuk Jung(DNDE, Korea) Su Do Lee(DNDE, Korea) Su Do Lee(DNDE, Korea) Seok Heum Baek(DNDE, Korea)

Paper No. 182

“Simulation of the Hydroabrasive Erosion of a Bucket: A Multiscale Model with Projective Integration to Circumvent the Spatio-Temporal Scale Separation”

Sebasti?n Leguizam?n(?cole Polytechnique F?d?rale de Lausanne (EPFL), Switzerland) Ebrahim Jahanbakhsh(?cole Polytechnique F?d?rale de Lausanne (EPFL), Switzerland) Ebrahim Jahanbakhsh(?cole Polytechnique F?d?rale de Lausanne (EPFL), Switzerland) Siamak Alimirzazadeh(?cole Polytechnique F?d?rale de Lausanne (EPFL), Switzerland) Fran?ois Avellan(?cole Polytechnique F?d?rale de Lausanne (EPFL), Switzerland)

Paper No. 207

“Research of key technology for turbine efficiency measurement based on thermodynamics method”

ye zhou(China Institute of Water Resources and Hydropower Research, China) luoping pan(China Institute of Water Resources and Hydropower Research, China) luoping pan(China Institute of Water Resources and Hydropower Research, China) yongqiang liu(China Institute of Water Resources and Hydropower Research, China)

R305

Cavi. & Multi. Flow⑧

Paper No. 75

“Stochastic modelling of cavitation erosion in Francis runner”

Quentin Chatenet(?cole de Technologie Sup?rieure (?TS), Canada) Laurent T?n-Th?t(Institut de Recherche d'Hydro-Qu?bec (IREQ), Canada) Laurent T?n-Th?t(Institut de Recherche d'Hydro-Qu?bec (IREQ), Canada) Mitra Fouladirad(Universit? de Technologie de Troyes (UTT), France) Antoine Tahan(?cole de Technologie Sup?rieure (?TS), Canada) Emmanuel Remy(EDF R&D, France)

Paper No. 229

“Cavitation in a Spool Valve for Water Hydraulics”

Hitomi OKABE(Graduate School of Science and Technology, Shinshu University, Japan) Yukiko TANAKA(Faculty of Engineering, Shinshu University, Japan) Yukiko TANAKA(Faculty of Engineering, Shinshu University, Japan) Futoshi YOSHIDA(KYB Corporation, Japan) Shouichiro IIO(Faculty of Engineering, Shinshu University, Japan) Yoshiaki HANEDA(National institute of technology, Nagano College, Japan)

Paper No. 230

“Influence of gas desorption in a safety relief valve undergoing cavitation”

Marcos Lema(University of A Coruña, Spain) Anne Gosset(University of A Coruña, Spain) Anne Gosset(University of A Coruña, Spain)

Paper No. 299

“Comparative research on various turbulence closure models for unsteady cavitation flows in the ultra-low specific speed centrifugal pump”

Cong Wang(China University of Petroleum, Beijing, China) Yongxue Zhang(China University of Petroleum, Beijing, China) Yongxue Zhang(China University of Petroleum, Beijing, China) Zhiwei Li(China University of Petroleum, Beijing, China) Ao Xu(China University of Petroleum, Beijing, China)

Paper No. 353

“Detection of erosive cavitation on hydraulic turbines. Field Assessment”

Alexandre Presas(Tsinghua University, China) David Valentin(UPC, Spain) David Valentin(UPC, Spain) Came Valero(UPC, Spain) Eduard Egusquiza(UPC, Spain) Yongyao Luo(Tsinghua University, China) Zhengwei Wang(Tsinghua University, China)

RY306

Ocean Hydro^③

Paper No. 276

“A Straight-bladed Vertical Axis Turbine for Wave Energy Conversion: Effect of Guide Vane Position on the Performance”

Masaki SAKAGUCHI(Saga University, Japan) Yasutaka HAYAMIZU(National Institute of Technology, Yonago College, Japan) Yasutaka HAYAMIZU(National Institute of Technology, Yonago College, Japan) Shinichi MORITA(National Institute of Technology, Yonago College, Japan) Shigeru OHTSUKA(National Institute of Technology, Yonago College, Japan) Manabu TAKAO(National Institute of Technology, Matsue College, Japan) Yoichi KINOUE(Saga University, Japan) Toshiaki SETOGUCHI(Saga University, Japan)

Paper No. 375

“Development of Ocean Current Marine Turbine”

Shinkichi Tanigaki(Mitsubishi Heavy Industries, Ltd., Japan) Hiroyuki Ishida(Mitsubishi Heavy Industries, Ltd., Japan) Hiroyuki

Ishida(Mitsubishi Heavy Industries, Ltd., Japan) Shin Asano(Mitsubishi Heavy Industries, Ltd., Japan) Nobuyasu Sakata(Mitsubishi Heavy Industries, Ltd., Japan)

Paper No. 397

“A Numerical Study on Performance Improvement of Counter-Rotating Type Tidal Stream Power Unit”

Hoyun Jung(Institute of Ocean Energy, Saga University, Japan) Toshiaki Kanemoto(Institute of Ocean Energy, Saga University, Japan)
Toshiaki Kanemoto(Institute of Ocean Energy, Saga University, Japan) Tengen Murakami(Institute of Ocean Energy, Saga University, Japan)

Paper No. 415

“Development and performance evaluation of stall delay bi-directional air turbine with additional blades”

Mitsumasa Iino(Ashikaga Institute of Technology, Japan) Jun Nakamura(FUJI ELECTRIC CO., LTD., Japan) Jun Nakamura(FUJI ELECTRIC CO., LTD., Japan) Takeaki Miyazaki(The University of Tokyo, Japan) Makoto Iida(The University of Tokyo, Japan)

Paper No. 287

“Multipole Optimization of Turbine Arrays in Tidal Flows”

Christian Schmitz(TU Darmstadt, Germany) David Kr?mer(TU Darmstadt, Germany) David Kr?mer(TU Darmstadt, Germany)

Thursday Morning (September 20)

10:00 - 12:00

RY202

Hydraulic Turbines^⑫

Paper No. 231

“Francis design and prediction technology for flexible operation”

Joel Chamberland-Lauzon(Andritz Hydro, Canada) Christine Monette(Andritz Hydro, Canada) Christine Monette(Andritz Hydro, Canada)

Matthieu Melot(Andritz Hydro, Canada) Stefan Birk(Andritz Hydro, Germany) Nicolas Ruchonnet(Andritz Hydro, Switzerland)

Paper No. 248

“Numerical analysis of a Kaplan turbine model transient operation”

Raluca_G. Iovanel(University POLITEHNICA of Bucharest, Romania) Diana_M. Bucur(University POLITEHNICA of Bucharest, Romania)

Diana_M. Bucur(University POLITEHNICA of Bucharest, Romania) Michel_J. Cervantes(Luleå University of Technology, Sweden)

Paper No. 232

“Numerical simulation of air injection in Francis turbine”

Denis Chirkov(Institute of Computational Technologies SB RAS, Russia) Pavel Shcherbakov(Institute of Computational Technologies SB

RAS, Russia) Pavel Shcherbakov(Institute of Computational Technologies SB RAS, Russia) Sergey Cherny(Institute of Computational

Technologies SB RAS, Russia) Alexander Zakharov(PJSC "Power Machines" LMZ, Russia)

Paper No. 234

“Numerical and experimental investigation of the runner channel vortex in Francis turbines regarding its dynamic flow characteristics and its influence on pressure oscillations”

Marcelo V. Magnoli(Voith Hydro Holding GmbH & Co. KG, Germany) Danijel Anciger(Voith Hydro Holding GmbH & Co. KG, Germany)

Danijel Anciger(Voith Hydro Holding GmbH & Co. KG, Germany)

Paper No. 241

“Numerical simulation and analysis at partial load in Francis turbines: Three-dimensional topology and frequency signature of inter-blade vortices”

François Doussot(Grenoble Institute of Technology, France) Guillaume Balarac(Grenoble Institute of Technology, France) Guillaume

Balarac(Grenoble Institute of Technology, France) Olivier Métais(Grenoble Institute of Technology, France) Claire Ségoufin(GE Renewable

Energy, France)

Paper No. 228

“Numerical and Experimental Analysis of Micro-class hydro Francis turbine”

Enkhtaivan Batmunkh(Korea Maritime and Ocean University, Korea)

R Y203

H/M F/S Interaction①

Paper No. 37

“Dynamic response of a NACA0009 hydrofoil under cavitation conditions”

Wei Wang(China Agricultural University, China) Lingjiu Zhou(China Agricultural University, China) Lingjiu Zhou(China Agricultural University, China) Xavier Escaler(Universitat Politècnica de Catalunya-Barcelona Tech, Spain) Oscar De La Torre(University of Bristol, United Kingdom) Wenzhe Kang(China Agricultural University, China)

Paper No. 221

“An Experimental Investigation of the Hydrodynamic Damping of Vibrating Hydrofoils”

Carl W Bergan(Norwegian University of Science and Technology, Norway) Erik O Tengs(EDR&Medeso AS, Norway) Erik O Tengs(EDR&Medeso AS, Norway) Ole Gunnar Dahlhaug(Norwegian University of Science and Technology, Norway)

Paper No. 33

“Numerical Simulation of the Hydrodynamic Damping of a Vibrating Hydrofoil”

Erik Tengs(Norwegian University of Science and Technology, Norway) Carl Bergan(Norwegian University of Science and Technology, Norway) Carl Bergan(Norwegian University of Science and Technology, Norway) Martin Holst(EDR Medeso, Norway) Ken-Robert Jakobsen(EDR Medeso, Norway)

Paper No. 78

“Prediction of vibration amplitudes on hydraulic profiles under von Karman vortex excitation”

Bernd Nennemann(Andritz Hydro Canada Inc., Canada) Christine Monette(Andritz Hydro Canada Inc., Canada) Christine Monette(Andritz Hydro Canada Inc., Canada)

Paper No. 148

“PIV measurements and CFD simulations of a hydrofoil at lock-in”

Kristian F Sagmo(Norwegian University of Science and Technology, Norway) Erik O Tengs(EDR&Medeso AS, Norway) Erik O Tengs(EDR&Medeso AS, Norway) Pål-Tore Storli(Norwegian University of Science and Technology, Norway)

R Y204

Pumps⑨

Paper No. 2

“Experimental and numerical study on flow induced characteristics of centrifugal pump under air-water bubble inflow”

Q R Si(National Research Center of Pumps, China) W T He(National Research Center of Pumps, China) W T He(National Research Center of Pumps, China) S Q Yuan(National Research Center of Pumps, China) G Bois(LMFL, FRE CNRS 3723, France) K Y Zhang(National Research Center of Pumps, China)

Paper No. 92

“Investigation on internal flow of gas - liquid two - phase flow in centrifugal pumps based on dimensionless method”

qianglei Cui(Research Center of Fluid Machinery Engineering and Technology, Jiangsu University, Zhenjiang 212013, China, China) qiaorui Si(Research Center of Fluid Machinery Engineering and Technology, Jiangsu University, Zhenjiang 212013, China, China) qiaorui Si(Research Center of Fluid Machinery Engineering and Technology, Jiangsu University, Zhenjiang 212013, China, China) shouqi Yuan(Research Center of Fluid Machinery Engineering and Technology, Jiangsu University, Zhenjiang 212013, China, China) jianping Yuan(Research Center of Fluid Machinery Engineering and Technology, Jiangsu University, Zhenjiang 212013, China, China) Wenting He(Research Center of Fluid Machinery Engineering and Technology, Jiangsu University, Zhenjiang 212013, China, China)

Paper No. 213

“Multiphase Performance and Internal Flow Pattern of Helico-axial Pumps”

Yun XU(Institute of fluid machinery & engineering, China) Shu-liang CAO(Institute of fluid machinery & engineering, China) Shu-liang CAO(Institute of fluid machinery & engineering, China) Tokiya WAKAI(Fluid Dynamics No.2 Laboratory, Japan) Takeshi SANO(Fluid Dynamics No.2 Laboratory, Japan)

Paper No. 422

“Computational Analysis of Flow Field Characteristics of a Liquid Rocket Unshrouded Impeller”

Hideyo Negishi(JAXA, Japan) Shinji Ohno(Ryoyu System Co., Ltd., Japan) Shinji Ohno(Ryoyu System Co., Ltd., Japan) Yohei Ogawa(JAXA, Japan)

Paper No. 367

“Experimental Investigation on Suction Performance and Cavitation Instabilities of Turbopumps with Two Different Inducers”

Tatsuya Morii(Kyushu University, Japan) Yohei Tanaka(Kyushu University, Japan) Yohei Tanaka(Kyushu University, Japan) Satoru Ohashi(IHI Corporation, Japan) Yasushi Matsunaga(IHI Corporation, Japan)

RY303

Comp. & Exp.④

Paper No. 253

“Cost-effective CFD for vortex shedding from a trailing edge of hydraulic turbine blade”

Sadao Kurosawa(Toshiba, Japan) Masahiko Nakazono(Toshiba, Japan) Masahiko Nakazono(Toshiba, Japan)

Paper No. 272

“GPU-Accelerated Pelton Turbine Simulation Using Finite Volume Particle Method with Linear Eddy Viscosity Models”

Siamak Alimirzazadeh(École polytechnique fédérale de Lausanne, Switzerland) Takashi Kumashiro(Hitachi Mitsubishi Hydro Corporation, Japan) Takashi Kumashiro(Hitachi Mitsubishi Hydro Corporation, Japan) Audrey Maertens(École polytechnique fédérale de Lausanne, Switzerland) Ebrahim Jahanbakhsh(École polytechnique fédérale de Lausanne, Switzerland) Kiyohito Tani(Hitachi Mitsubishi Hydro Corporation, Japan) François Avellan(École polytechnique fédérale de Lausanne, Switzerland)

Paper No. 290

“Pump to Turbine Transient for a Pump-Turbine in a Model Test Circuit and a Real Size Power Plant”

Stefan Riedelbauch(University of Stuttgart, Germany) Christine Stens(University of Stuttgart, Germany) Christine Stens(University of Stuttgart, Germany)

Paper No. 254

“Transposition of efficiencies between prototype and model of an axial turbine for ultra-low heads using Computational Fluid Dynamics tool”

Antonio Carlos Barkett Botan(Universidade Federal de Itajubá, Brazil) Ramiro Gustavo Ramirez Camacho(Universidade Federal de Itajubá, Brazil) Ramiro Gustavo Ramirez Camacho(Universidade Federal de Itajubá, Brazil) Tiago Martins de Azevedo(Universidade Federal de Itajubá, Brazil) Jacek Swiderski(Swiderski Engineering Inc, Canada) Tony Tung(Tung Hydraulics Energy Technologies, Canada) Joe Martin(Norcan Hydraulic Turbine Inc., Canada)

Paper No. 255

“Scale adaptive simulation of draft tube flow for application in the hydraulic design process”

Roland Jester-Zörker(Voith Hydro Holding GmbH & Co. KG, Germany) Paul Weber(Voith Hydro Holding GmbH & Co. KG, Germany) Paul Weber(Voith Hydro Holding GmbH & Co. KG, Germany)

RY305

Cavi. & Multi. Flow[®]

Paper No. 236

“Vibration and Flow Characteristics near Cavitation Occurrence in Mixed-Flow Pump”

Hyeonmo Yang(Korea Institute of Industrial Technology, Korea) Kyoung-Yong Lee(Korea Institute of Industrial Technology, Korea) Kyoung-Yong Lee(Korea Institute of Industrial Technology, Korea) Young-Seok Choi(Korea Institute of Industrial Technology, Korea)

Paper No. 243

“Numerical Prediction of Efficiency and Cavitation for a Pelton Turbine”

Dragica Jost(Kolektor Turboinstitut, Slovenia) Aljaž Kerlavaj(Kolektor Turboinstitut, Slovenia) Aljaž Kerlavaj(Kolektor Turboinstitut, Slovenia) Valentin Pirnat(Kolektor Turboinstitut, Slovenia) Enrico Nobile(University of Trieste, Italy)

Paper No. 338

“Water Column Separation at Turbine Start Up Loading”

Aleksandar Gajic(Universiyu of Belgrade, Serbia) Stanislav Pejovic(Toronto University, Canada) Stanislav Pejovic(Toronto University, Canada)

Paper No. 344

“Numerical Study on Cavitating Flow-induced Vibration of Liquid Rocket Engine Inducer”

Qin Wu(Tsinghua University, China) Biao Huang(Beijing Institute of Technology, China) Biao Huang(Beijing Institute of Technology, China) Guoyu Wang(Beijing Institute of Technology, China) Shuliang Cao(Tsinghua University, China)

Paper No. 345

“Effect of Different Start-up Characteristics on the Cavitation Performance in Rotary Lobe Pump”

Yibin Li(Lanzhou University of Technology, China) Dongsheng Guo(Lanzhou University of Technology, China) Dongsheng Guo(Lanzhou University of Technology, China)

RY306

WS:PumpedStorage①

Paper No. 211

“Transient approach for identification of the S-shape region of pump turbines”

Wilhelm Weber(Voith Hydro Holding GmbH & Co. KG, Heidenheim, Germany, Germany) Jens Kahler(Voith Hydro Holding GmbH & Co. KG, Heidenheim, Germany, Germany) Jens Kahler(Voith Hydro Holding GmbH & Co. KG, Heidenheim, Germany, Germany) Armin Schuh(Voith Hydro Holding GmbH & Co. KG, Heidenheim, Germany, Germany) Jiri Koutnik(Voith Hydro Holding GmbH & Co. KG, Heidenheim, Germany, Germany)

Paper No. 247

“Hump Characteristic of Pump-Turbine with Splitter Blades under Different Guide Vane Openings”

JING JIA(Jiangsu University, China)

Paper No. 67

“Influence of Cavitation on Hump Characteristics in a Pump-Turbine Model”

Deyou Li(Harbin Institute of Technology, China) Song Lin(Harbin Institute of Technology, China) Song Lin(Harbin Institute of Technology, China) Wenwen Fu(Harbin Institute of Technology, China) Jinxia Chen(Harbin Institute of Large Electrical Machinery, China) Xianzhu Wei(Harbin Institute of Large Electrical Machinery, China) Daqing Qin(Harbin Institute of Large Electrical Machinery, China)

Paper No. 101

“Studies on the evolutions of the axial force and moment of the runner and guide vanes during runaway transient process in pump mode”

Zhiyan Yang(Wuhan University, China) Yongguang Cheng(Wuhan University, China) Yongguang Cheng(Wuhan University, China)

Paper No. 412

“Non-axisymmetric flow characteristic in a pump turbine runner at pump mode”

Like Wang(Xi'an University of Technology, China) Weili Liao(Xi'an University of Technology, China) Weili Liao(Xi'an University of Technology, China)

Paper No. 418

“Experiments and numerical simulations of a flow instability in a low-specific-speed Pump-Turbine”

Koichiro Matsumura(Aoyama Gakuin University, Japan) Kazuhiko Yokota(Aoyama Gakuin University, Japan) Kazuhiko Yokota(Aoyama Gakuin University, Japan) Wakana Tsuru(Aoyama Gakuin University, Japan) Hayate Sugiyama(Aoyama Gakuin University, Japan)

Thursday Afternoon (September 20)

13:20 - 15:00

RY202

Hydraulic Turbines^⑬

Paper No. 381

“Motion Prediction of Foreign Matters using CFD-DEM Method in Francis Turbines for Small and Medium Power Stations”

Yamato Imasaka(Waseda University, Japan) Hitoshi Kanno(Waseda University, Japan) Hitoshi Kanno(Waseda University, Japan) Motohiko Nohmi(Ebara Corporation, Japan)

Paper No. 260

“On Modeling Runner Included into a Hydroacoustic System”

Vladimir_Yu. Borodulin(Kutateladze Institute of Thermophysics SB RAS, Russia) Aleksandr_A. Dekterev(Kutateladze Institute of Thermophysics SB RAS, Russia) Aleksandr_A. Dekterev(Kutateladze Institute of Thermophysics SB RAS, Russia) Andrey_V. Minakov(Kutateladze Institute of Thermophysics SB RAS, Russia) Georgy_A. Semenov(PJSC "Power Machines" LMZ, Russia) Aleksandr_V. Zakharov(PJSC "Power Machines" LMZ, Russia)

Paper No. 265

“CFD Analysis of Flow Pattern in S-Shape Region for Low Specific Speed Francis Turbine”

Katsutoshi Kobayashi(Hitachi, Ltd., Japan) Yuta Tamura(Hitachi Mitsubishi Hydro Corporation, Japan) Yuta Tamura(Hitachi Mitsubishi Hydro Corporation, Japan)

Paper No. 271

“Kaplan turbine working as a propeller: CFD investigation and experimental validation of generated power fluctuation.”

Mauricio A Angulo(Universidad Nacional de La Plata, Argentina) Arturo Rivetti(Universidad Nacional de La Plata, Argentina) Arturo Rivetti(Universidad Nacional de La Plata, Argentina) Sergio O Liscia(Universidad Nacional de La Plata, Argentina)

Paper No. 293

“Numerical Investigation of Blade Tip Cavitation on Large Discharge Condition of Diagonal Turbine”

Yuta Tamura(Hitachi Mitsubishi Hydro Corporation, Japan) Tomoaki Ishihara(Hitachi Mitsubishi Hydro Corporation, Japan) Tomoaki Ishihara(Hitachi Mitsubishi Hydro Corporation, Japan) Kenji Shingai(Hitachi Mitsubishi Hydro Corporation, Japan)

R Y203

H/M F/S Interaction②

Paper No. 316

“Excitation of torsional modes in guide vanes due to rotor stator interaction”

Eivind Myrvold(Rainpower, Norway) Jan Tore Billdal(Rainpower, Norway) Jan Tore Billdal(Rainpower, Norway) Bjørn Haugen(NTNU, Norway)

Paper No. 339

“Validation of CFD Analysis of Acoustic Effects in Pump Turbine Runners”

Olivier Braun(Andritz AG, Austria) Nicolas Ruchonnet(ANDRITZ HYDRO AG, Switzerland) Nicolas Ruchonnet(ANDRITZ HYDRO AG, Switzerland) Adrien Taruffi(ANDRITZ HYDRO AG, Switzerland) Arno Gehrler(ANDRITZ AG, Austria)

Paper No. 188

“Fluid added polar inertia and damping for the torsional vibration of a Kaplan turbine model runner considering multiple perturbations”

Arash Soltani Dehkharghani(Lulea University of Technology, Sweden) Jan-Olov Aidanp??(Lulea University of Technology, Sweden) Jan-Olov Aidanp??(Lulea University of Technology, Sweden) Michel J. Cervantes(Lulea University of Technology, Sweden)

Paper No. 13

“Energy Flow Transmission Analysis on the Powerhouse Vibration under Turbine Hydraulic Loads”

Zhenyue MA(School of Hydraulic Engineering, China) Wei XU(School of Hydraulic Engineering, China) Wei XU(School of Hydraulic Engineering, China)

Paper No. 352

“Behavior of Francis turbines at part load. Field assessment in prototype: Effects on power swing”

David Valentin(UPC, Spain) Alexandre Presas(UPC, Spain) Alexandre Presas(UPC, Spain) Carme Valero(UPC, Spain) Eduard Egusquiza(UPC, Spain)

R Y204

Pumps⑩

Paper No. 444

“Influence of the Tip Clearance on the Auto-Oscillation Frequency of a

Cavitating Pump”

Peter F. Pelz(TU Darmstadt, Germany) Paul Taubert(TU Darmstadt, Germany) Paul Taubert(TU Darmstadt, Germany)

Paper No. 51

“Cavitation Performance of a Vertical Condensate Pump Featured by the Impeller with Long and Short Blades”

Can Kang(Jiangsu University, China) Shuang Teng(Jiangsu University, China) Shuang Teng(Jiangsu University, China) Kejin Ding(Shanghai Marine Equipment Research Institute, China) Ning Mao(Jiangsu University, China) Yongchao Zhang(Jiangsu University, China)

Paper No. 181

“Implementation of a passive control system for limiting cavitation around hydrofoils”

Tommaso Capurso(Polytechnic University of Bari, Italy) Michele Lorusso(Polytechnic University of Bari, Italy) Michele Lorusso(Polytechnic University of Bari, Italy) Sergio M. Camporeale(Polytechnic University of Bari, Italy) Marco Torresi(Polytechnic University of Bari, Italy)

Paper No. 371

“Three dimensional numerical analysis of inducer about suppression of cavitation instabilities by asymmetric slits on blades”

Yoshito Kamikura(Tohoku University, Japan) Hiroki Kobayashi(Tohoku University, Japan) Hiroki Kobayashi(Tohoku University, Japan) Satoshi Kawasaki(Japan Aerospace Exploration Agency, Japan)

Paper No. 430

“The suppression of cavitation surge in a double-suction centrifugal pump by using branch-type and slit-type accumulations installed at a pump outlet pipe”

Tomoshige Maeda(Aoyama Gakuin University, Japan) Wakana Tsuru(Aoyama Gakuin University, Japan) Wakana Tsuru(Aoyama Gakuin University, Japan) Tomoki Tsuneda(EBARA Corporation, Japan) Byungjin An(EBARA Corporation, Japan) Shusaku Kagawa(EBARA Corporation, Japan) Motohiko Nohmi(EBARA Corporation, Japan) Kazuhiko Yokota(Aoyama Gakuin University, Japan)

RY303

Comp. & Exp.⑤

Paper No. 320

“CFD analysis of the hydrodynamic characteristics of an eccentric shaft in a canned motor”

Zhen Jia(Tsinghua University, China) Zhigang Zuo(Tsinghua University, China) Zhigang Zuo(Tsinghua University, China)

Paper No. 340

“Stereo PIV measurement of vortices in a model pump intake”

Miao Guo(College of Water Resources and Civil Engineering, China) Xuelin Tang(College of Water Resources and Civil Engineering, China)
Xuelin Tang(College of Water Resources and Civil Engineering, China) Fujun Wang(College of Water Resources and Civil Engineering, China)

Paper No. 348

“Numerical Modeling of a Laser Generated Cavitation Bubble with a Coupled Level Set and Volume of Fluid Method”

Jianyong Yin(China University of Petroleum-Beijing, China) Yongxue Zhang(China University of Petroleum-Beijing, China) Yongxue Zhang(China University of Petroleum-Beijing, China)

Paper No. 350

“Numerical study on various vortices in pump sump based on LBM-LES”

Jun Lei Lei(China Agricultural University, China) Xuelin Tang(China Agricultural University, China) Xuelin Tang(China Agricultural University, China) Miao Guo Guo(China Agricultural University, China)

Paper No. 374

“Experimental and Numerical Investigation of Flow Field in Flexible Tube”

Dominik ?ediv?(Faculty of Mechanical Engineering, Brno University of Technology, Czech) Simona Fialov?(Faculty of Mechanical Engineering, Brno University of Technology, Czech) Simona Fialov?(Faculty of Mechanical Engineering, Brno University of Technology, Czech)

R305

WS:Single- & Multi-Stage①

Paper No. 65

“Investigation on Inner Flow Quality Assessment of Centrifugal Pump Based on Euler Head and Entropy Production Analysis”

Bo Qian(Zhejiang University, China) Jinping Chen(Jiangsu Zhenhua Pump Ltd., China) Jinping Chen(Jiangsu Zhenhua Pump Ltd., China) Dazhuan Wu(Zhejiang University, China) Peng Yan(Science and Technology on Water Jet Propulsion Laboratory, Marine Design & Research Institute of China(Maric), China) Shiyang Li(Zhejiang University, China)

Paper No. 332

“Prediction of flow phenomena, performance and thrust forces of three-stage pump by using URANS”

Hiroyoshi Watanabe(Ebara Corporation, Japan)

Paper No. 365

“Detailed Flow Characteristic Analyses of a Three-Stage Centrifugal Pump at Design and Off-Design Conditions”

Jin-Hyuk Kim(Korea Institute of Industrial Technology , Korea) Bo-Min Cho(ANFLUX Inc., Korea) Bo-Min Cho(ANFLUX Inc., Korea) Yong-Kab Lee(ANFLUX Inc., Korea) Young-Seok Choi(Korea Institute of Industrial Technology, Korea)

Paper No. 305

“Unsteady RANS Simulation of Three-stage Centrifugal Pumps with Different Impeller-Diffuser Gaps”

Taiki Takamine(Kyushu University, Japan) Satoshi Watanabe(Kyushu University, Japan) Satoshi Watanabe(Kyushu University, Japan)

RY306

WS:Pumped Storage②

Paper No. 32

“Optimized design the pump turbine based on LDV and PIV”

Demin Liu(Dongfang Electric Machinery CO., LTD, China) yongzhi Zhao(0, China) yongzhi Zhao(0, China)

Paper No. 431

“Design of a pump-turbine using a quasi-potential flow approach, mathematical optimization and CFD”

Frantisek Pochyly(Brno University of Technology, Czech) Pavel Rudolf(Brno University of Technology, Czech) Pavel Rudolf(Brno University of Technology, Czech) Prokop Moravec(Brno University of Technology, Czech) Jiri Stejskal(Brno University of Technology, Czech) Ales Skotak(CKD Blansko Engineering, Czech)

Paper No. 203

“Multiobjective optimization design of ultrahigh-head pump turbine runners with splitter blades”

zan ao hu(xihua university, China) baoshan zhu(tsinghua university, China) baoshan zhu(tsinghua university, China) zhe ma(tsinghua university, China) cheng xue(xi hua university, China)

Paper No. 97

“A study on the evolution of the instability in two model pump-turbine runners with large blade leans”

Zhe Ma(Tsinghua University, China) Baoshan Zhu(Tsinghua University, China) Baoshan Zhu(Tsinghua University, China)

Paper No. 456

“Experimental and numerical investigation of flows inside draft tube of a pump-turbine”

Xide Lai(Xihua University, China) Quanwei Liang(Dongfang Electric Machinery Co. Ltd, China) Quanwei Liang(Dongfang Electric Machinery Co. Ltd, China) Xiaoming Chen(Xihua University, China) Qiuqin Gou(Xihua University, China) Qinghua Zhang(Xihua University, China)

Thursday Evening (September 20)

15:20 - 17:40

RY202

Hydraulic Turbines^⑭

Paper No. 302

“A Step Forward: IEC 62097-Edition 2 ‘HYDRAULIC MACHINES, RADIAL AND AXIAL ? METHODOLOGY FOR PERFORMANCE TRANSPOSITION FROM MODEL TO PROTOTYPE”

Kotaro Tezuka(Toshiba Energy Systems & Solutions Corporation, Japan) Nadine Pajean-Wassong(EDF, France) Nadine Pajean-Wassong(EDF, France) Jacob Iosfin(BC Hydro, Canada)

Paper No. 311

“Effect of spiral vortices on the stability of vortex structures in turbine draft tube”

Frantisek Pochyly(Brno University of Technology, Faculty of Mechanical Engineering, Czech) Simona Fialova(Brno University of Technology, Faculty of Mechanical Engineering, Czech) Simona Fialova(Brno University of Technology, Faculty of Mechanical Engineering, Czech)

Paper No. 319

“Francis turbine high load instabilities - Model Test and CFD simulation”

Daniel_Amancio Rodriguez(Universidad Nacional de La Plata, Argentina) Arturo Rivetti(Universidad Nacional de La Plata, Argentina) Arturo Rivetti(Universidad Nacional de La Plata, Argentina) Cecilia_Veronica Lucino(Universidad Nacional de La Plata, Argentina) Sergio_Oscar Liscia(Universidad Nacional de La Plata, Argentina)

Paper No. 363

“CFD-based rehabilitation for the high specific speed Francis turbine”

Koichi Kubo(Toshiba Corporation , Japan) Takahiro Nakashima(Toshiba Corporation , Japan) Takahiro Nakashima(Toshiba Corporation , Japan) Yasuyuki Enomoto(Toshiba Corporation , Japan)

Paper No. 376

“Development of high-efficiency and low-cost unshrouded turbine runner for small scale hydropower plant”

Takamitsu Aida(Tanaka Hydropower Co., Ltd., Japan) Kazuyoshi Miyagawa(Waseda University, Japan) Kazuyoshi Miyagawa(Waseda University, Japan)

R Y203

H/M F/S Interaction③

Paper No. 141

“Random Vibration Characteristics of Perforated Plates in Parallel Flow”

Cheng Xue(Xihua University , China) Baoshan Zhu(Tsinghua University, China) Baoshan Zhu(Tsinghua University, China) Yoshitsugu NEKOMOTO(Mitsubishi Heavy Industries, Ltd., Japan) Jinsheng Liu(Tsinghua University, China) Dongni Liu(Dalian Maritime University, China)

Paper No. 436

“Journal bearing with non-Newtonian fluid in the area of Taylor vortices”

Simona Fialova(Brno University of Technology, Faculty of Mechanical Engineering, Czech) Milada Kozubkova(Technical University Ostrava, Czech) Milada Kozubkova(Technical University Ostrava, Czech) Michal Havlasek(Brno University of Technology, Faculty of Mechanical Engineering, Czech) Frantisek Pochyly(Brno University of Technology, Faculty of Mechanical Engineering, Czech) Dominik Sedivy(Brno University of Technology, Faculty of Mechanical Engineering, Czech)

Paper No. 441

“Computational analysis of flow-driven string dynamics in a pump and residence time calculation”

Kenji Komiya(Waseda University, Japan) Taro Kanai(Waseda University, Japan) Taro Kanai(Waseda University, Japan) Masayuki Kaneko(Waseda University, Japan) Kyohei Hirota(Waseda University, Japan) Kenji Takizawa(Waseda University, Japan) Yutong Zhang(Rice University, United States) Tayfun E Tezduyar(Rice University, United States) Motohiko Nohmi(EBARA corporation, Japan)

Paper No. 244

“Advanced Simulation of Coupled Physics in Thrust Bearings”

Bjoern Huebner(Voith Hydro Holding GmbH & Co. KG, Germany) Daniel R.B. Silva(Voith Hydro Holding GmbH & Co. KG, Germany) Daniel R.B. Silva(Voith Hydro Holding GmbH & Co. KG, Germany)

R Y303

Comp. & Exp.⑥

Paper No. 380

“Sloshing in Liquid Tank with the Density Function Method”

Koichi Tsubogo(the Open University of Japan, Japan) Masayuki Hyodo(Yamaguchi University, Japan) Masayuki Hyodo(Yamaguchi University, Japan)

Paper No. 399

“CFD, A Complementary Tool To Experimental Analysis Methods For Flows In A Centrifugal Pump Vaned Diffuser”

Annie-Claude Bayeul-Lain?(Arts et Metiers PARISTECH, France) Patrick Dupont(Ecole Centrale de LILLE, France) Patrick Dupont(Ecole Centrale de LILLE, France) G?rard bois(Arts et Metiers PARISTECH, France)

Paper No. 437

“Reduction of the mathematical model of liquid flow withing an instability”

Frantisek Pochyly(Brno University of Technology, Faculty of Mechanical Engineering, Czech) Ondrej Urban(Brno University of Technology, Faculty of Mechanical Engineering, Czech) Ondrej Urban(Brno University of Technology, Faculty of Mechanical Engineering, Czech)

Paper No. 446

“Roll-up region of tip vortex: numerical investigation”

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“Influence of Hydraulic Characteristics on Transient Behavior of Ultra High Head Pump Turbine”

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Paper No. 9

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“Experimental investigation on the pressure pulsations in variable-speed Francis turbines using steady state model-test data”

Igor Iliev(Norwegian University of Science and Technology, Norway) Chirag Trivedi(Norwegian University of Science and Technology, Norway) Chirag Trivedi(Norwegian University of Science and Technology, Norway) Ole Gunnar Dahlhaug(Norwegian University of Science and Technology, Norway)