

FULL SCHEDULE TECHNICAL PARALLEL SESSIONS

Monday March 22 2021 Parallel Sessions 2.00PM – 3.45 PM CET	
	HYDRAULIC TURBINES 1 Chair: <i>Bernd Nennemann</i>
2.00 PM	Advanced Optimization Tools for Hydro Turbine Runner Design <i>LESTRIEZ Rémi, CALVO MAYO Daniel, MENDICINO Domenico</i> <i>Numlberica</i>
2.20 PM	An experimental study on the upper part-load elliptical vortex instability in a Francis turbine <i>A Amini, E Vagnoni, A Favrel, K Yamaishi, A Müller, F Avellan</i> <i>EPFL - PTMH</i>
2.40 PM	Prediction of vortex precession in the draft tube of a model hydro turbine using mean field stability theory and stochastic modelling <i>Oberleithner Kilian, Müller Jens, Sieber Moritz, Litvinov Ivan, Shtork Sergey, Alekseenko Sergey</i> <i>Technical University Berlin</i>
3.00 PM	Mitigation of Draft Tube Pressure Pulsations by Radial Protrusion of Solid Bodies into the Flow Field: An Experimental Investigation <i>Shiraghaee Shahab, Sundström Joel, Raisee Mehrdad, Cervantes Michel</i> <i>Department of Engineering Sciences and Mathematics, Luleå University of Technology, Luleå, Sweden</i>
	PUMPS 1 Chair: <i>Prof. Pavel Rudolf</i>
2.00 PM	Performance Optimization on Impeller of Centrifugal Pump Based on Improved Discrete Genetic Algorithm <i>Jinwei Chen, Wenjie Wang, Ji Pei</i> <i>National Research Center of Pumps</i>
2.20 PM	Research on the hydraulic losses in suction boxes and discharge passages with the change of rotational speed of pumping system <i>Honggeng ZHU, Jiren ZHOU, Xueqin LIU, Rentian ZHANG, Jilin CHENG</i> <i>School of Hydraulic Science and Engineering, Yangzhou University, Yangzhou 225127, China</i>
2.40 PM	Effects of Impeller Trimming on Pressure Fluctuation in a Double-Suction Centrifugal Pump <i>Honggeng ZHU, Jiren Deng Qifan, Pei Ji, Wang Wenjie, Yuan Shouqi</i>
3.00 PM	Numerical study of the reverse conditions of the reactor coolant pumps <i>Ran Hongjuan, Qian Xinru, Shi Tianjiao</i> <i>Shanghai Jiaotong University</i>
3.20 PM	Volute throat area and wall modelling influence on the numerical performances of a very low specific speed pump <i>Chabannes Lilian, Rudolf Pavel, Štefan David</i> <i>Brno University of Technology, Faculty of Mechanical Engineering</i>
	HYDRAULIC SYSTEMS 1 Chair: <i>Dr. Sebastien Alligné</i>
2.00 PM	Transient in a water treatment plant (WTP), example of reverse osmosis of Basra WTP <i>Chaverial Bruno</i> <i>VEOLIA Environnement</i>
2.20 PM	Developments in multiple-valve water-hammer control <i>Bergant Anton, Haessig Simon, Karadžić Uroš, Urbanowicz Kamil, Tijsseling Arris</i> <i>Litostroj Power d.o.o; University of Ljubljana</i>

2.40 PM	Monitoring 4.0 of penstocks: digital twin for fatigue assessment <i>Dreyer Matthieu, Nicolet Christophe, Gaspoz Anthony, Rey-Mermet Samuel, Saillen Claude, Boulicaut Bruno</i> <i>Power Vision Engineering</i>
3.00 PM	<i>Theoretical Turbine Model with Hydraulic Losses</i> <i>Svingen Bjørnar, F Reines Ane, K Nielsen Torbjørn</i> <i>Department of Energy and Process Engineering, NTNU, Norway</i>
3.20 PM	Hydraulic Design Challenges of High Head 880 MW Gouvães Pumped Storage Power Plant <i>Nicolet Christophe, Landry Christian, Richter Wolfgang, Vera Rodriguez Juan Carlos, De La Torre Abietar Luis, Zenz Gerald</i> <i>Power Vision Engineering</i>
	NUMERICAL SIMULATIONS 1 Chair: Prof. Cécile Münch-Alligné
2.00 PM	Application of general discrete adjoint method for draft tube optimization <i>B Fleischli, A Del Rio, E Casartelli, L Mangani, B F Mullins, C Devals, M Melot</i> <i>Lucerne University of Applied Sciences and Arts, Technik & Architektur, Horw, Switzerland</i>
2.20 PM	CFD simulations of a Y-junction for the implementation of hydraulic short-circuit operating mode <i>J Decaix, D Biner, J-L. Drommi, F Avellan, C Münch-Alligné</i> <i>Institute of Sustainable Energy, School of Engineering, HES-SO Valais</i>
2.40 PM	Influence of turbulent inlet conditions on the flow inside a bulb turbine draft tube using large-eddy simulations <i>P Véras, G Balarac, O Métais, D Georges, A Bombenger, C Ségoufin</i> <i>Univ. Grenoble Alpes, CNRS, Grenoble INP, LEGI</i>
3.00 PM	<i>Emergency gate closing in a Kaplan turbine intake for runaway condition: CFD transient study for two-phase flow and experimental validation</i> <i>Rivetti Arturo, Angarita Guillermo, Angulo Mauricio, Botero Francisco, Liscia Sergio</i> <i>Laboratorio de Hidromecánica, Facultad de Ingeniería, Universidad Nacional de La Plata, Argentina</i>
3.20 PM	Francis 99 CFD through RapidCFD accelerated GPU code <i>D Molinero, S Galván, F. Domínguez, L Ibarra and G Solorio</i> <i>Universidad Michoacana de San Nicolás de Hidalgo</i>

Monday March 22 2021
Parallel Sessions 4.00PM – 5.45 PM CET

	HYDRAULIC TURBINES 2 Chair: Dr. Loïc Andolfatto
4.00 PM	Investigation of sediment erosion phenomenon for different blade angle distribution in Francis runner <i>Acharya Nirmal, Trivedi Chirag, Gautam Saroj, Dahlhaug Ole Gunnar</i> Norwegian University of Science and Technology
4.20 PM	Study of Flow Characteristics inside Francis Turbine Draft Tube with Adjustable Guide Vanes <i>Joy Jesline, Raisee Dekhordi Mehrdad, J. Cervantes Michel</i> Luleå tekniska universitet
4.40 PM	3D numerical investigation of the swirling flow in a straight diffuser or the variable speed values of the rotor obtained with a magneto-rheological brake <i>Szakai Raul Alexandru, Muntean Sebastian, Bosioc Alin Ilie, Susan-Resiga Romeo, Vekas Ladislau</i> University Politehnica Timisoara
5.00 PM	Assessment of advanced RANS turbulence models for the stability analysis of low specific speed pump-turbines <i>del Rio Armando, Casartelli Ernesto, Mangani Luca, Roos-Launchbury David</i> Lucerne University of Applied Sciences & Arts, Department of Mechanical Engineering
5.20 PM	MOC-CFD coupled model of load rejection in a hydropower station <i>Mandair Sharon, Morissette Jean-François, Magnan Robert, Karney Bryan</i> Department of Civil Engineering, University of Toronto
	CAVITATION AND MULTIPHASE FLOWS 1 Chair: Dr. Sebastian Muntean
4.00 PM	On the Physical Mechanisms that Cause the Full Load Instability in Francis Turbines <i>Wack Jonas, Riedelbauch Stefan</i> University of Stuttgart
4.20 PM	Numerical study of flow behaviour in a cavitation tunnel using RANS with Scale-Adaptive Simulation (SAS) turbulence model in an OpenFOAM framework <i>V Hidalgo, G Suárez, J Erazo, D Puga, D Márquez, I Benavides, E Cando, E Valencia and X Luo</i> Departamento de Ingeniería Mecánica, Escuela Politécnica Nacional, Quito
4.40 PM	Cavitation erosion mechanism: numerical study of the interaction between pressure waves and vapour bubbles <i>Leclercq Christophe, Fortes Patella Regiane, Archer Antoine</i> LEGI, University of Grenoble Alpes
5.00 PM	Assessment of turbulence models for the prediction of Bénard-Von Kármán vortex shedding behind a truncated hydrofoil in cavitation conditions <i>Chen Jian, Geng Linlin, Escaler Xavier, De La Torre Oscar</i> UNIVERSITAT POLITÈCNICA DE CATALUNYA
	EXPERIMENTAL TECHNIQUES 1 Chair: Prof. Carme Valero
4.00 PM	Particle image velocimetry measurements in the vaneless space of a model Francis turbine under steady state operation <i>K F Sagmo, A Maerlie, P T Storli</i> Norwegian University of Science and Technology
4.20 PM	Water flows generating hysteresis on the S-shape <i>NICHELE Sylvain, BAYLE Simon, VAILLANT Yves, JANSON Eric, GUILLAUME Renaud, HOUELINE Jean-Bernard</i> SuperGrid Institute
4.40 PM	Selection and Optimization of Sensors for Monitoring of Francis Turbines <i>Valentin David, Presas Alexandre, Valero Carme, Egusquiza Mònica, Egusquiza Eduard</i> UPC

5.00 PM	<p>Temporary shutdowns of the high-head run-of-river HPP Fieschertal to prevent excessive turbine erosion during floods <i>Felix David, Abgottspon André, Albayrak Ismail, Boes Robert M.</i> <i>ETH Zürich, Laboratory of Hydraulics (VAW)</i></p>
5.20 PM	<p>Analysis of hydro-abrasive erosion and efficiency changes measured on the coated Pelton turbines of HPP Fieschertal <i>Abgottspon André, von Burg Martin, Staubli Thomas, Felix David</i> <i>Hochschule Luzern, Fluid Mechanics and Hydraulic Machines</i></p>
	<p>NUMERICAL SIMULATIONS 2 Chair: <i>Dr. Keita Yamamoto</i></p>
4.00 PM	<p>Fully automated multidisciplinary design optimization of a variable speed turbine <i>Tengs Erik, Charrassier Flora, Jordal Maria Rolstad, Iliev Igor</i> <i>EDR&Medeso AS</i></p>
4.20 PM	<p>Influence of flow patterns on the performance of straight-through labyrinth seals. Numerical study and validation against experimental data <i>Rocca Andrea, Troyer Stefan, Casetta Alberto</i> <i>Troyer AG</i></p>
4.40 PM	<p>Numerical simulations of Pelton turbine flow to predict large head variation influence <i>Alimirzazadeh Siamak, Decaix Jean, Avellan François, Crettenand S., Münch-Alligné Cécile</i> <i>HES-SO Valais</i></p>

Tuesday March 23 2021
Parallel Sessions 9.00AM – 10.30 AM CET

	HYDRAULIC TURBINES 3 Chair: Prof. Zhengwei Wang
9.00 AM	Stay vane cracks induced by von Karman vortices for a Francis turbine <i>Qinghua Shi, Haiping Tian</i> <i>Dong Fang Electrical Machinery Company, Limited</i>
9.20 AM	Experimental and Numerical Investigations of Erosion on Runner Seal of a Francis Turbine <i>Yonezawa Koichi, Watamura Tomoaki</i> <i>Civil Engineering Laboratory, Central Research Institute of Electric Power Industry, Abiko, Japan</i>
9.40 AM	Study on Instability and Improvement Strategy of Vortex Rope in Francis-Turbine <i>Li Deyou, Yu Liang, Wang Hongjie, Yang Xuyu, Zhang Nan, Wei Xianzhu</i> <i>Harbin Institute of Technology</i>
10.00 AM	Research on State Evaluation and Prediction System of Hydraulic Turbine Based on Pressure Pulsation Parameters <i>Xiaoping Jiang, Xiang Gao, Jiawei Hu, Ziting Wang, Lele Wang</i> <i>China University of Mining and Technology, Beijing</i>
	HYDRAULIC TURBINES 4 Chair: Prof. Eduard Egusquiza
9.00 AM	Experimental study on load rejection process of a model tubular turbine <i>Zhou Daqing, Chen Huixiang, Kan Kan, Yu An, Binama Maxime, Chen Yanan</i> <i>College of Energy and Electrical Engineering, Hohai University, Nanjing</i>
9.20 AM	Research and Application of Fractional-order PI Control Algorithm for Turbines in Small Hydropower Stations <i>Wang Ziting</i> <i>China University of Mining&Technology, Beijing</i>
9.40 AM	Research on Hydraulic Performances of Pumps as Turbines with S-blade impeller <i>WANG Xiaohui, MIAO Senchun, YANG Junhu, KUANG Kailin, WU Zanzhi</i> <i>Lanzhou University of Technology</i>
10.00 AM	Production flexibility of small run-of-river power plants: KWGO smart-storage case study <i>C Münch-Alligné, J Decaix, A Gaspoz, V Hasmatuchi, M Dreyer, C Nicolet, S Alimirzazadeh, J Zordan, P Manso, S Crettenand</i> <i>HES-SO Valais/Wallis</i>
	NUMERICAL SIMULATIONS 3 Chair: Dr. Sebastian Leguizamon
9.00 AM	Numerical simulation prediction of pressure distribution of guide vanes in a high-head pump turbine <i>He Lei, Gao Zhongxin, Chen Ying, Zhang Jianguang, Ma Bingquan, Meng Xiaochao, Lei Rao</i> <i>China Institute of Water Resources and Hydropower Research</i>
9.20 AM	The coupled dynamic analysis of hydroelectric unit and powerhouse considering the bolt connection characteristics <i>Z Y Ma, H Y Chen, H Z Zhang</i> <i>Dalian University of Technology</i>
9.40 AM	Numerical investigation of a Pelton turbine at various operating conditions with experimental validations <i>Chitrakar Sailesh, Neopane Hari Pd, Pandey Bishal, Shrestha Suprim, Solemslie Bjørn W, Dahlhaug Ole G</i> <i>Kathmandu University</i>
10.00 AM	Application of particle-based numerical analysis to practical design of Pelton turbine <i>Kumashiro Takashi, Alimirzazadeh Siamak, Tani Kiyohito, Avellan François</i> <i>Hitachi Mitsubishi Hydro Corporation, Hitachi, Japan</i>
	EXPERIMENTAL TECHNIQUES 2 Chair: Dr. Arthur Favrel

30th IAHR Symposium on Hydraulic Machinery and Systems



9.00 AM	Research of Turbine Efficiency Test by Current-Meter Method in Circular Pipe <u>Ye Zhou, D F Cao, X F Ge and L J Tan</u> <i>China Institute of Water Resources and Hydropower Research</i>
9.20 AM	Novel techniques for analysis of dynamic pressure in penstocks <u>Chevillotte Fabien, Pavic Goran, Dubois Guillaume, Proulx Gilles, Gagnon Martin</u> <i>Matelys - Research Lab, Vaulx en Velin, France</i>
9.40 AM	Modal testing of the Francis-99 runner <u>Solemslie Bjørn Winther, Ole Gunnar Dahlhaug, Bjarki Sigurdsson, Erik O Tengs</u> <i>Norwegian Institute for Nature Research</i>
10.00 AM	Stereo-PIV study of unsteady flow in a laboratory air hydro turbine model over a wide range of operating regimes <u>Litvinov Ivan, Sharaborin Dmitrii, Gorelikov Evgeny, Suslov Daniil, Shtork Sergey</u> <i>Kutateladze Institute of Thermophysics</i>

Tuesday March 23 2021
Parallel Sessions 10.45AM – 12.30 AM CET

	HYDRAULIC TURBINES 5 Chair: Prof. Romeo Susan-Resiga
10.45 AM	Research on Modeling and Control Strategy of Hydraulic Turbine Governing System Based on Improved Genetic Algorithm <i>JIANG Xiaoping, CHEN Xiaofei, WANG Zhengwei</i> <i>Department of Electrical Engineering, China University of Mining and Technology (Beijing)</i>
11.05 AM	Effect of Inlet Section of Circular Section Spiral Case on Performance of Ultra-Low Specific Speed Diagonal Flow Turbine <i>Xiaoyu Chen, Yanpin Li</i> <i>North China University of Water Resources and Electric power</i>
11.25 AM	Numerical study on Unstable Hydraulic Factors of Kaplan turbine with semi-spiral case at large flow rate conditions <i>Yaping Zhao, Zhihua Li, Mengfan Dang, Jianjun Feng</i> <i>Xi'an University of Technology</i>
11.45 AM	Experimental study and parametric analysis for primary frequency regulation of hydropower unit <i>Wang Cong, Wang Dekuan, Zhang Jianmin</i> <i>China Institute of Water Resources and Hydropower Research</i>
12.05 PM	The influence of the S shaped characteristics of high head pump-turbine on the minimum pressure of draft tube <i>Zhang meiqin, Zhang shubang, Chen jianfu, Wei xianzhu, Wang wei, Su yanyi</i> <i>Harbin Electric Machinery Company Limited</i>
	PUMPS 2 Chair: Prof. Kazuyoshi Miyagawa
10.45 AM	Multi-objective optimization design of a multiphase rotodynamic pump impeller <i>Zhang Wenwu, Zhu Baoshan, Ma Zhe</i> <i>Department of Energy and Power Engineering, Tsinghua University, Beijing</i>
11.05 AM	Numerical investigation on a double suction twin-screw multiphase pump <i>S H Sun, P B Wu, P C Guo, G Z Yi, A Kovacevic, H, Zhang, G K Wu</i> <i>State Key Laboratory of Eco-Hydraulics in northwest Arid region of china, Xi'an University of Technology</i>
11.25 AM	Experimental investigation of sediment erosion in a double-suction centrifugal pump in sandy rivers <i>Qian Zhongdong, Su Jiahui, Guo Zhiwei, Yang Bing, Dong Jing</i> <i>State key laboratory of water resources and hydropower engineering science, Wuhan University</i>
11.45 AM	Study on the evolution of internal flow structure in screw centrifugal inducer vortex pump <i>Hui Quan, Jing Cheng, Ying Guo, Lei Kang, Xinyang Yu, Sizhe Quan</i> <i>College of Energy and Power Engineering, Lanzhou University of Technology</i>
	HYDRAULIC SYSTEMS 2 Chair: Dr. Christophe Nicolet
10.45 AM	Research and development of visual numerical simulation software for transient process of hydropower station <i>Guo Wencheng, Zhou Jianzhong, Wang Bingbao</i> <i>School of Hydropower and Information Engineering, Huazhong University of Science and Technology</i>
11.05 AM	Experimental influence of a splitter vane on the flow fields in a wide-angled diffuser <i>GUO Miao, MENG Xu, ZUO Zhigang, LIU Shuhong</i> <i>State Key Laboratory of Hydro Science and Engineering, Department of Energy and Power Engineering, Tsinghua University, Beijing</i>
11.25 AM	Turbine mode start-up simulation of a FSFC variable speed pump-turbine prototype – Part I: 1D simulation <i>S Alligné, A Béguin, D Biner, C Münch-Alligné, V Hasmatuchi, N Hugo, F Avellan, D Dujic, C Nicolet</i> <i>Power Vision Engineering</i>

	CAVITATION AND MULTIPHASE FLOWS 2 Chair: <i>Dr. Ali Amini</i>
10.45 AM	One-dimensional numerical simulation of cavitation surge in pumping system considering cavity response delay <i>Watanabe Satoshi, Tsujimoto Yoshinobu</i> <i>Department of Mechanical Engineering, Kyushu University, Japan</i>
11.05 AM	Influence of impeller vane arrangement on efficiency performance and pressure fluctuations of a double-suction centrifugal pump <i>SONG Yu, TAN Lei, XU Yun, LIU Yabin</i> <i>Institute of Nuclear and New Efficiency Technology, Tsinghua University, Beijing 100084, China.Colla</i>
11.25 AM	Effect of the winglet on reduction of blade tip vortex from elliptical hydrofoil <i>Maeda Satoshi, Sano Takeshi, Iino Masamichi, Farhat Mohamed, Amini Ali</i> <i>Mitsubishi Heavy Industries, Ltd., Research & Innovation Center</i>
11.45 AM	Investigation of water column separation induced by pressure pulsation based on critical cavitation rate model <i>J B Yang, J D Yang, W C Guo, J J Luo, G F Fu</i> <i>Zhongnan Engineering Corporation Limited</i>
12.05 PM	Numerical prediction of slurry erosion and its influence on prevailing flow conditions using a dynamic mesh method <i>Hankeln Fabian, Kirschner Oliver, Riedelbauch Stefan</i> <i>Institute of Fluid Mechanics and Hydraulic Machinery, University of Stuttgart</i>

Tuesday March 23 2021
Parallel Sessions 2.00PM – 3.45 PM CET

	HYDRAULIC TURBINES 6 Chair: Prof. Stefan Riedelbauch
2.00 PM	Numerical assessment of parameters influencing the modal response of a Kaplan turbine model <u>Roig Rafael, De La Torre Oscar, Jou Esteve, Escaler Xavier</u> <i>Fluid Mechanics Department, Universitat Politècnica de Catalunya (UPC)</i>
2.20 PM	Development of a novel numerical framework in OpenFOAM to simulate Kaplan turbine transients <u>Salehi Saeed, Nilsson Håkan, Lillberg Eric, Edh Nicolas</u> <i>Chalmers University of Technology</i>
2.40 PM	Investigations on fatigue curves in dependency of water quality for nickel-martensitic steels <u>Leibing Benjamin, von Locquenghien Florian, Rückle Dagmar, Schellenberg Geert</u> <i>Voith Hydro Holding GmbH & Co KG</i>
3.00 PM	Numerical Simulation of Hydraulic Turbine During Transient Operation Using OpenFOAM <u>Salehi Saeed, Nilsson Håkan, Lillberg Eric, Edh Nicolas</u> <i>Chalmers University of Technology</i>
3.20 PM	Accurate and efficient analysis of dynamic runner stresses considering hydrodynamic damping effects <u>Huebner Bjoern, Koutnik Jiri</u> <i>Voith Hydro Holding GmbH & Co. KG</i>
	PAT Chair: Dr. João Delgado
2.00 PM	Numerical and experimental study of pump as turbine for sediment affected micro hydropower project in Nepal <u>Pokharel Nischal, Ghimire Amul, Thapa Dr. Biraj Singh, Thapa Prof. Bhola, Guo Dr. Zhiwei, Qian Prof. Zhongdong</u> <i>Turbine Testing Lab, Kathmandu University</i>
2.20 PM	A marine propeller as a hydrokinetic turbine – CFD analysis of energy characteristics <u>Ristić Bogdan, Božić Ivan, Simić Aleksandar</u> <i>University of Belgrade, Faculty of ME, Dept. of Hydraulic Machinery and Energy Systems</i>
2.40 PM	Optimization of Pump-Turbine Using Sequential Quadratic Programming, Genetic Algorithms And Testing Cfd <u>Ramirez Camacho Ramiro Gustavo, Rodrigues dos Santos Marcos Antonio, de Oliveira Waldir, Tiago Geraldo Lucio,</u> <u>Galván Gonzáles Sergio Ricardo, Ortiz Ramiro</u> <i>Universidade Federal de Itajubá</i>
3.00 PM	Novel Method for Vortex Rope Characterization by Image Processing In A Pump As Turbine (Pat) <u>Angarita Guillermo, Richard Sylvain, Bolaños Hernan, Botero Francisco, Palacio Claudia</u> <i>Universidad Eafit, Grupo de Mecánica Aplicada, Cr 49 No. 7 sur 50, Medellín, Colombia</i>
	PUMPED STORAGE 1 Chair: Prof. Cécile Münch-Alligné
2.00 PM	Pump-Turbines in Conventional Hydropower Plants <u>Njølstad Dagsvik Helene, Storli Pål-Tore</u> <i>Norwegian University of Science and Technology (NTNU)</i>
2.20 PM	Numerical flow simulation of pump stability for pumped storage units with analysis and visualization of the dynamic flow patterns <u>Magnoli Marcelo, Giese Martin</u> <i>Voith Hydro Holding GmbH & Co. KG</i>
2.40 PM	Numerical analysis of an initial design of a counter-rotating pump-turbine <u>Fahlbeck Jonathan, Nilsson Håkan, Salehi Saeed, Zangeneh Mehrdad, Joseph Melvin</u> <i>Mechanics and Maritime Sciences, Chalmers University of Technology</i>
3.00 PM	Opening sequence optimization for La Coche pumps back-to-back start-up through electrically coupled Pelton unit <u>Andolfatto Loïc, Rentschler Martin, Haeussler Walter, Gervais Nicolas</u> <i>Andritz Hydro SA</i>

3.20 PM	Experimental investigation of a free surface oscillation in a model pump-turbine <i>Maly Anton, Bauer Christian</i> <i>TU Wien - Institut of Energy Systems and Thermodynamics</i>
	NUMERICAL SIMULATIONS 4 Chair: Prof. Ernesto Casartelli
2.00 PM	Developing a 1D-3D model to investigate the effect of entrapped air on pressure surge during the rapid filling of a pipe <i>Maddahian Reza, Shaygan Farhad, Bucur Diana Maria</i> <i>Faculty of Mechanical Engineering, Tarbiat Modares University, Tehran, Iran</i>
2.20 PM	Turbine mode start-up simulation of a variable speed Francis pump-turbine prototype – Part II: 3D unsteady CFD and FEM pump-turbine prototype – Part II: 3D unsteady CFD and FEM <i>D. Biner, S. Alligné, V. Hasmatuchi, C. Nicolet, N. Hugo, F. Avellan, D. Dujic, C. Münch-Alligné</i> <i>HES-SO Valais-Wallis, School of Engineering, Systems Engineering Institute</i>
2.40 PM	Numerical Prediction of Runaway Characteristics of Kaplan Turbines Applying Cavitation Model <i>Semenova Aleksandra, Chirkov Denis, Ustimenko Aleksandr</i> <i>PJSC Power Machines Saint Petersburg, Russia</i>
3.00 PM	A Turbulence Model Assessment for Deep Part Load Conditions of a Francis Turbine <i>J Wack, J Beck, P Conrad, F von Locquenghien, R Jester-Zürker and S Riedelbauch</i> <i>Institute of Fluid Mechanics and Hydraulic Machinery, University of Stuttgart</i>
3.20 PM	Measurement and simulation of the dynamic characteristics of plain and profiled annular seals <i>M M G Kuhr, G Ludwig, P F Pelz</i> <i>Chair of Fluid Systems, Technische Universität Darmstadt, Germany</i>

Tuesday March 23 2021
Parallel Sessions 4.00PM – 5.45 PM CET

	HYDRAULIC TURBINES 7 <i>Chair: Dr. Elena Vagnoni</i>
4.00 PM	Simulation of a hydrostatic pressure machine with an open source flow solver <i>Pienika Rodolfo, Usera Gabriel, Ramos Helena</i> <i>IMFIA, Facultad de Ingeniería, Universidad de la República</i>
4.20 PM	Reconstruction of the Francis 99 main runner blade using a hybrid parametric approach <i>Ángel Cerriteño, Giovanni Delgado, Sergio Galván, Francisco Domínguez-Mota, Ramiro Ramírez</i> <i>Universidad Michoacana de San Nicolás de Hidalgo, Faculty of Mechanical Engineering</i>
4.40 PM	Simplified Simulation of a small Pelton turbine using OpenFOAM <i>V Hidalgo, C Díaz, J Erazo, S Simbaña, D Márquez, D Puga, R Velasco, C Mafla, G Barragán, C Parra, E Valencia and X Luo</i> <i>Departamento de Ingeniería Mecánica, Escuela Politécnica Nacional, Quito</i>
5.00 PM	Emergency Gates - Model Scale Tests at Turbine Runaway Condition <i>Angulo Mauricio, Rivetti Arturo, Diaz Leonardo, Lucino Cecilia, Liscia Sergio</i> <i>Laboratory of Hydromechanics, La Plata, Argentina</i>
5.20 PM	Evaluation of guide vanes effect over runner Francis turbine sediment erosion using a quasi-two dimensional approach <i>L M Quishpe, E A Valencia, V H Hidalgo, O I Zambrano, E H Cando</i> <i>Departamento de Ingeniería Mecánica, Escuela Politécnica Nacional, Quito, Ecuador</i>
	CAVITATION AND MULTIPHASE FLOWS 3 <i>Chair: Dr. Jonas Wack</i>
4.00 PM	Numerical investigation of the effects of hydrofoil vibrations on the unsteady behavior of cavitation <i>Geng Linlin, Chen Jian, De La Torre Oscar, Escaler Xavier</i> <i>Universitat Politècnica de Catalunya</i>
4.20 PM	Scale adaptive simulation of unsteady cavitation flow around a plane convex hydrofoil with a semi-cylindrical obstacle <i>V Hidalgo, X Escaler, A Díaz, X Luo, S Simbaña, D Márquez, P Hernandez and E Valencia</i> <i>Departamento de Ingeniería Mecánica, Escuela Politécnica Nacional, Quito</i>
4.40 PM	Cavitation modeling using real gas state equation: A conceptual study <i>Hanimann Lucian, Mangani Luca, Casartelli Ernesto, Darwish Marwan, K Claramunt</i> <i>Lucerne University of Applied Sciences & Arts, Department of Mechanical Engineering</i>
5.00 PM	Recent advancements in mitigating tip vortex cavitation <i>A. Amini, T. Sano, M. Iino, M. Reclari, J. Seo, S. Rhee, M. Farhat</i> <i>EPFL</i>
	EXPERIMENTAL TECHNIQUES 3 <i>Chair: Prof. Yves St-Amant</i>
4.00 PM	Francis turbine dynamic stresses measurements at model and prototype scales <i>Chamberland-Lauzon Joel, Monette Christine, Bernd Nennemann, Samer Afara, John Disciullo</i> <i>Andritz Hydro Canada Inc.</i>
4.20 PM	Operational Modal Analysis of Francis Turbine Runner Blades Using Transient Measurements <i>Gagnon Martin, Dollon Quentin, Nicolle Jonathan, Morissette Jean-François</i> <i>Institut de Recherche d'Hydro-Québec (IREQ)</i>
4.40 PM	A proposal for the dynamic strain interpolation on hydroelectric turbine runner <i>Pham Quang Hung, Gagnon Martin, Antoni Jérôme, Tahan Antoine, Monette Christine</i> <i>École de technologie supérieure (ÉTS), Montréal, Québec, Canada</i>
5.00 PM	Strain prediction in Francis runners by means of stationary sensors <i>Presas Alexandre, Valentin David, Zhao Weiqiang, Valero Carme, Egusquiza Monica, Egusquiza Eduard</i> <i>UPC</i>

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5.20 PM | Experimental investigation of swirl number influence on spiral vortex structure dynamics
D. Stefan, M Hudec, V Uruba, P Prochazka, O Urban, P Rudolf
Brno University of Technology, Faculty of Mechanical Engineering

Wednesday March 24 2021
Parallel Sessions 9.00AM – 10.30 AM CET

	HYDRAULIC TURBINES 8 Chair: <i>Dr. Olivier Braun</i>
9.00 AM	Dynamic behaviour of a full-load cavitation vortex in a Francis turbine draft tube excited at its eigenfrequencies <i>A Favrel, E Vagnoni, J Gomes Pereira Junior, M Sakamoto, K Yamaishi, A Müller, F Avellan and K Miyagawa</i> <i>Waseda University</i>
9.20 AM	Effect of the leakage flow in runner on flow characteristics of a Francis turbine model <i>S J Kim, Y S Choi, Y Cho, J W Choi, J J Hyun, W G Joo and J H Kim</i> <i>Industrial Technology, Korea University of Science & Technology, Rep. of Korea</i>
9.40 AM	Numerical and experimental analysis of pressure fluctuations in the draft-tube of a Francis turbine using the swirl number <i>M H Khozaei, A Favrel, T Masuko, N Yamaguchi, R Watanabe, and K Miyagawa</i> <i>Department of Applied Mechanics, Graduate School of Mechanical Engineering, Waseda University</i>
10.00 AM	Numerical simulation of the unsteady cavitating flow in a Francis turbine draft tube at Upper-Part-Load (UPL) conditions <i>Zhihao Liu, Arthur Tristan Favrel, Wataru Takahashi, Kazuyoshi Miyagawa</i> <i>Department of Applied Mechanics, Waseda University</i>
	EXPERIMENTAL TECHNIQUES 4 Chair : <i>Prof. François Avellan</i>
9.00 AM	Efficiency measurement on horizontal Pelton turbine by thermodynamic method <i>Cao Dengfeng, Zhou Ye, Pan Luoping, Wang Junjie</i> <i>China Institute of Water Resources and Hydropower Research</i>
9.20 AM	Proper orthogonal decomposition of turbulent swirling flow of a draft tube at part load <i>Kumar Sandeep, Khullar Subodh , Cervantes Michel J., Gandhi Bhupendra K.</i> <i>Indian Institute of Technology Roorkee</i>
9.40 AM	On-site discharge measurement technique in open channel aided by CFD <i>Ishihara Tomoaki, Kumashiro Takashi, Maekawa Masatake, Tani Kiyohito</i> <i>Hitachi Mitsubishi Hydro Corporation</i>
10.00 AM	Velocity Measurements in Kaplan and Propeller Turbines: a review <i>Nahale Sotoudeh, Mehrdad Raisee, Michel J. Cervantes</i> <i>Lulea University of Technology</i>
	PUMPED STORAGE 2 Chair: <i>Prof. Pal-Tore Storli</i>
9.00 AM	Transient TEHD Analysis of a Thrust Bearing Based on Two-Way Fluid-Solid-Thermal Interaction <i>Cao Jingwei, Zhai Liming, Luo Yongyao, Wang Zhengwei</i> <i>Department of Energy and Power Engineering, Tsinghua University</i>
9.20 AM	Numerical study of hydraulic axial force of prototype pump-turbine pump mode's stop with power down <i>Mao Zhongyu, Tao Ran, Bi Huili, Luo Yongyao, Wang Zhengwei</i> <i>Department of Energy and Power Engineering, Tsinghua University</i>
9.40 AM	Electricité de France Hydro's overview of the First Israeli Hydro-Electric Pumped Storage Power Plant: GILBOA PSPP <i>Dr. P. Maruzewska, T. Sautereau, D. Fauriela, J.-L. Drommia, Dr. G. Ciocanb, Dr. E. Lafflyb, Y. Sapirc, H. Barack</i> <i>EDF HYDRO</i>
10.00 AM	Influence of load variations on the fluid structure and force of blades in pump turbine load rejection process <i>Xiuli Mao, Giorgio Pavesi, Yuchuan Wang, Diyi Chen, Gaojun Mao</i> <i>Institute of Water Resources and Hydropower Research, Northwest A&F University</i>

	CAVITATION AND MULTIPHASE FLOWS 4 Chair: Prof. Regiane Fortes Patella
9.00 AM	Study on Gas Curtain Launching Characteristic under the Water <i>Xue Xiao Chun, Yu Yonggang</i>
9.20 AM	Low-frequency oscillations in hydroturbines caused by cavitation together with the phase transitions effects <i>Kuibin Pavel</i> <i>Kutateladze Institute of Thermophysics SB RAS</i>
9.40 AM	Modal Decomposition of Large-and Small-Scale Cloud Cavitation <i>Hatzissawidis G, Ludwig G, Pelz P F</i> <i>Technische Universität Darmstadt, Chair of Fluid Systems, Darmstadt, Germany</i>

Wednesday March 24 2021
Parallel Sessions 10.45AM – 12.30 AM CET

Wednesday March 24 2021 Parallel Sessions 10.45AM – 12.30 AM CET	
	HYDRAULIC TURBINES 9 Chair: Dr. Alexandre Presas
10.45 AM	CFD analysis of flow pattern in S-Shape region for low specific speed Francis turbine <i>Katsutoshi Kobayashi, Tamura Yuta</i> <i>Hitachi Mitsubishi Hydro Corporation</i>
11.05 AM	Numerical simulation of the runner channel vortex in Francis turbine <i>Huan Cheng, Lingjiu Zhou, Quanwei Liang, Demin Liu, Yongzhi Zhao</i> <i>Dongfang Electrical Machinery Co., Ltd</i>
11.25 AM	Numerical analysis of the sediment-laden flow behavior in a Pelton turbine bucket <i>Bao Guo, Yexiang Xiao, Anant Kumar Rai, Quanwei Liang, Jin Zhang</i> <i>State Key Laboratory of Hydrosience and Engineering & Department of Energy</i>
11.45 AM	Performance analysis of a new type of space guide vane for T-type hydraulic turbine <i>Jiang Yuxuan, Li Yanpin, Zhang Zichao, Chen Dexin</i> <i>North China University of Water Resources and Electric Power</i>
	PUMPS 3 Chair: Dr. Stefan Berten
10.45 AM	Experimental and Numerical simulation study of multistage centrifugal pump under low flow conditions <i>LI Chen Hao, LUO Xing Qi, FENG Jian Jun, ZHU Guo Jun, SUN Shuai Hui, YAN Si Na</i> <i>Xi'an University of Technology</i>
11.05 AM	Study on the influence of geometric Angle of meridian plane of inducer on cavitation of centrifugal pump <i>Cheng Xiaorui, Zhang Aimin</i> <i>Lanzhou University of Technology</i>
11.25 AM	Effect of inlet gas volume fraction on gas-liquid two-phase flow characteristics of centrifugal pump based on CFD-PBM coupling Model <i>GE Zhen-guo, HE Deng-hui, FENG Jian-jun, ZHU Guo-jun, LUO Xing-qi</i> <i>Xi'an University of Technology</i>
11.45 AM	Automatic optimization of vertical long-shaft fire pump overload based on PSO <i>Jinfeng Zhang, Liangqing Lai, Zhijun Yang, Chengming Jing, Haiqing Song</i> <i>Jiangsu Univ, Natl Res Ctr Pumps, Zhenjiang, China</i>
12.05 PM	The Relationship Research of Performances and Impeller Design Parameters for the Low specific speed Non-overload Centrifugal Pump <i>Yang Junhu, Wang Xiaohui, Huang Xiaolan</i> <i>Lanzhou University of Technology</i>
	PUMPED STORAGE 3 Chair: Dr. Christophe Nicolet
10.45 AM	Analysis of Dynamic Stresses of Pump-Turbine runner during Load Rejection Process in Turbine Mode <i>Chen Funan, Yang Xiaolong, Bi Huili, Mao Zhongyu, Luo Yongyao, Liu Jingshi, Fan Hongang, Wang Zhengwei</i> <i>Department of Energy and Power Engineering, Tsinghua University</i>
11.05 AM	Effect of Length of Main Water Conveyance Pipelines on Water Hammer Pressure in Pumped Storage Plant <i>Chen Sheng, Wang Jing, Chen Xue, Zhang Jian</i> <i>Hohai University</i>
11.25 AM	Analysis of Transient Force Performances of Pump-Turbine during Stop Process in Pump Mode <i>Yao Rao, Bi Huili, Wang Jun, Liu Tao, Chen Funan, Fan Hongang, Wang Zhengwei, Liu Jingshi</i> <i>Department of energy and power engineering, Tsinghua University</i>
11.45 AM	CFD Simulation of the Pump Trip Runaway Transients process of a pumped-storage power plant with head 700 m <i>Yang Zhiyan, Zhang Xiaoxi, Liu Demin, Cheng Yongguang, M D Zhao</i> <i>State Key Laboratory of Water Resources and Hydropower Engineering Science, Wuhan University</i>

12.05 PM	A new method for calculating transition process based on full characteristic modeling of turbine <i>Liu Xiao, Jiang Xiaoping, Xiao Yexiang</i> <i>Department of Electrical Engineering China University of Mining and Technology, Beijing</i>
	CAVITATION AND MULTIPHASE FLOWS 5 Chair: Prof. Peter F. Pelz
10.45 AM	Numerical simulation of air injection in part load operating point <i>Shcherbakov Pavel, Chirkov Denis, Skorospelov Vladimir, Turuk Polina</i> <i>Institute of Computational Technologies SB RAS, Novosibirsk, Russia</i>
11.05 AM	Research on the Control Mechanism of Cavitation of Low Specific Speed Centrifugal Pump by High Pressure Jet <i>Zhao Weiguo, Zhu Changjian, Li Qifei, Han Wei</i> <i>Lanzhou University of Technology</i>
11.25 AM	Numerical prediction of cavitation hydrodynamic performance for a pump-jet propulsor <i>Chen Yang, Yuan Jianping, Fu Yanxia, Wang Longyan</i> <i>Research Center of Fluid Machinery Engineering and Technology</i>
11.45 AM	Analysis and visualization of progressive erosion in Pelton buckets <i>Rai Anant Kumar, Kumar Arun, Yexiang Xiao, Guo Bao, Staubli Thomas</i> <i>Tsinghua University</i>
12.05 PM	Examination on characteristics of tip leakage vortex of an airfoil at high incidence angle <i>Zhu Guojun, Liu Jiamin, Feng Jianjun, Li Yunzhe, Wu Guangkuan, Luo Xingqi</i>

Wednesday March 24 2021
Parallel Sessions 2.00PM – 3.45 PM CET

	HYDRAULIC TURBINES 10 Chair: Prof. Zhengwei Wang
2.00 PM	Velocity profiles in a water jet of a Pelton nozzle: CFD simulations on both 2D and 3D geometries <i>Stivala Davide, Rossi Mosè, Renzi Massimiliano</i> <i>Free University of Bozen-Bolzano</i>
2.20 PM	Digitalization in hydropower generation: development and numerical validation of a model-based Smart Power Plant Supervisor <i>E. Vagnoni, F. Gerini, R. Cherkaoui, M. Paolone</i> <i>EPFL, Switzerland</i>
2.40 PM	Experimental investigation of sediment erosion of turbine steel used in Bhilangana-III power-plant <i>Sharma Shubham, K. Gandhi Bhupendra</i> <i>Department of Mechanical and Industrial Engineering, IIT Roorkee, Roorkee, India</i>
3.00 PM	Multi-objective shape optimization of Francis runner using metamodel assisted genetic algorithm <i>Chirkov Denis, Filatova Anastasiya, Polokhin Stepan</i> <i>Institute of Computational Technologies</i>
3.20 PM	Artificial Intelligence to enhanced turbomachinery design productivity <i>Dirk Wunsch, Charles Hirsch, Luca Zampieri</i> <i>NUMECA International</i>
	SUSTAINABLE HYDRO 1 Chair: Dr. Andres Müller
2.00 PM	Optimization of Francis runner for variable speed operation from the perspective of sediment erosion <i>Gautam Saroj, Neopane Hari Prasad, Thapa Biraj Singh, Chitrakar Sailesh, Lama Ram, Zhu Baoshan</i> <i>Turbine Testing Lab, Kathmandu University, Dhulikhel, Kavre, Nepal</i>
2.20 PM	Optimization of 92kW model Francis runner for minimizing sediment erosion <i>Lama Ram, Gautam Saroj, Neopane Hari Prasad, Thapa Biraj Singh, Chitrakar Sailesh</i> <i>Turbine Testing Lab, Kathmandu University, Dhulikhel, Kavre, Nepal</i>
2.40 PM	Influence of the runner cone design on the pressure fluctuations in the draft tube of a low head Francis turbine <i>Khullar Subodh, Kumar Sandeep, Singh Krishna M., Cervantes Michel J., Gandhi Bhupendra K.</i> <i>Department of Mechanical & Industrial Engineering, IIT Roorkee, India</i>
3.00 PM	Turbine Test Rig to Investigate Flow Instabilities in Draft Tube <i>Kumar Sandeep, Khullar Subodh, Cervantes Michel J., Gandhi Bhupendra K.</i> <i>Indian Institute of Technology Roorkee</i>
	NUMERICAL SIMULATIONS 5 Chair: Dr. Siamak Alimirzazadeh
2.00 PM	Study of an Ultra-Low-Head hydraulic turbine with variable speed <i>Botan Antonio, Ibarra Germán, Tiago Geraldo, Ramirez Ramiro</i> <i>Federal University of Itajubá, Brazil</i>
2.20 PM	Parametric Design Tool for development of a radial guide vane cascade for a variable speed Francis Turbine <i>Stojkovski Filip, Lazarevikj Marija, Markov Zoran</i> <i>"Ss. Cyril and Methodius" University in Skopje - Faculty of Mechanical Engineering</i>
2.40 PM	Stabilisation of the swirl exiting a Francis runner far from the best efficiency point <i>Susan-Resiga Romeo Florin, Muntean Sebastian, Bosioc Alin, Stuparu Adrian</i> <i>University Politehnica Timisoara</i>
3.00 PM	Shear and vortex instabilities at deep part load of hydraulic turbines and their numerical prediction <i>B Nennemann, M Melot, C Monette, M Gauthier, S Afara, J Chamberland-Lauzon, and T Jurvansuu</i> <i>Andritz Hydro Canada Inc.</i>

3.20 PM	Numerical Investigation of flow instabilities in Speed No-Load operation of a Bulb turbine <i>K Yamamoto, M Roubary, M Morisod, M Coulaud, S Houde</i> <i>Laboratoire de Machines Hydrauliques (LAMH), Département de génie mécanique, Université Laval, Quebec</i>
	EXPERIMENTAL TECHNIQUES 5 Chair: Dr. David Valentin
2.00 PM	Influence of the elbow shape on the unsteady pressure field in decelerated swirling flows <i>Muntean Sebastian, Mos Daniel Calin, Szakal Raul Alexandru, Bosioc Alin Ilie, Susan-Resiga Romeo</i> <i>Romanian Academy - Timisoara Branch</i>
2.20 PM	Test facility for transient operation point changes of hydraulic machinery <i>Kirschner Oliver, Junginger Johannes, Riedelbauch Stefan</i> <i>Institute of Fluid Mechanics and Hydraulic Machinery, University of Stuttgart</i>
2.40 PM	Model test with sensor equipped Francis runner for Part Load Operation <i>von Locquenghien Florian, Peter Faigle, Aschenbrenner Thomas</i> <i>Voith Hydro Holding GmbH & Co. KG</i>
3.00 PM	<i>Innovative experimental facility for reduced scale model testing of hydraulic machines hybridized with a battery energy storage system</i> <i>F. Gerini, E. Vagnoni, M. Seydoux, R. Cherkaoui, and M. Paolone</i> <i>EPFL</i>
3.20 PM	Transient Analysis of Pelton Turbine Prototypes <i>Egusquiza Mònica, Valentin David, Valero Carne, Presas Alexandre, Egusquiza Eduard</i> <i>Center for Industrial Diagnostics (CDIF) - Polytechnic University of Catalonia (UPC)</i>

Wednesday March 24 2021
Parallel Sessions 4.00PM – 5.45 PM CET

HYDRAULIC TURBINES 11 <i>Chair: Dr. Gagnon Martin</i>	
4.00 PM	<i>Evolution of discharge and runner rotation speed along no-load curves of Francis turbines</i> <i>Fortin Melissa, Houde Sébastien, Nennemann Bernd, Deschênes Claire</i> LAMH, Mechanical Engineering Department
4.20 PM	Geometric parameters of influence on rotor stator interaction in radial hydraulic turbines <i>B Nennemann, S Afara, C Monette, O Braun</i> <i>Andritz Hydro Canada Inc.</i>
4.40 PM	Comprehensive stay vane vibration analysis by means of numerical and experimental approaches <i>Sampaio Ricardo, D'Agostini Neto Alexandre, de Camargo Gissoni Humberto, Marras Filho Rubens, Roque da Silva Assi Gustavo, Marangon Cicolin Murilo</i> <i>Voith Hydro Ltda.</i>
5.00 PM	Pump-turbine Rotor-Stator Interaction Induced Vibration: Problem Resolution and Experience F Zhang, <i>PY Lowys</i> , JB Houdeline, XD Guo, P Hong and Y Laurant Pumped-storage Power Institute of Technology and Economy, State Grid Xinyuan Company Ltd., Beijing
SUSTAINABLE HYDRO 2 <i>Chair: Dr. Jean-François Morissette</i>	
4.00 PM	Influence of operation modes and fish behavior on fish passage through turbines <i>Stoltz Ulli, Geiger Franz, Tuhtan Jeffrey A.</i> <i>Voith Hydro Holding GmbH & Co. KG</i>
4.20 PM	On the Comparison of Hydroelectric Runner Fatigue Failure Risk Based on Site Measurements <i>Morin Olivier, Gagnon Martin, Thibault Denis</i> <i>Hydro-Québec</i>
4.40 PM	Upper limit for tidal turbines Pelz Peter, Schmitz Christian TU Darmstadt, Chair of Fluid Systems
EXPERIMENTAL TECHNIQUES 6 <i>Chair: Prof. Sebastien Houde</i>	
4.00 PM	A new real time hydraulic test platform dedicated to Ancillary Services <i>Hugo Mesnage, Renaud Guillaume, Seddik Bacha, Simon Bayle, Sylvain Nichele</i> <i>Supergrid-Institute</i>
4.20 PM	Experimental investigation to determine equivalent sand grain roughness for hydraulic surfaces <i>Nicolle Jonathan, Hazel Bruce, Gauthier Hélène</i> <i>Institut de Recherche d'Hydro-Québec (IREQ)</i>
4.40 PM	Calibration of critical speed predictions using experimental measurements <i>Dollon Quentin, Monette Christine, Gagnon Martin, Tahan Antoine, Antoni Jérôme</i> <i>Andritz Hydro Ltd., Pointe-Claire, Canada</i>
5.00 PM	Investigation of dynamic pressure fluctuations in closed hydraulic circuits as a function of centrifugal pump speed gradients <i>Büker Johannes, Laß Andre, Wurm Frank-Hendrik</i> <i>Institute of Turbomachinery, Faculty of Mechanical Engineering and Marine Technology, University of Rostock, Rostock DE</i>
5.20 PM	New test rig for micro and mini hydraulic axial turbines in Uruguay <i>Pienika Rodolfo, Rovira Ignacio, Rodríguez Nicolás</i> <i>IMFIA, Facultad de Ingeniería, Universidad de la República</i>

Thursday March 25 2021
Parallel Sessions 9.00AM – 10.30 AM CET

	HYDRAULIC TURBINES 12 Chair: Prof. Pal-Tore Storli
9.00 AM	Development of Low-Specific Speed New-Type Hydraulic Turbine Equipped with Volute: Numerical Investigation and Performance Prediction <i>Irie Tatsuya, Takahashi Wataru, Miyagawa Kazuyoshi, Sugimoto Takayuki, Naganuma Tsubasa, Waku Reijiro</i> <i>Department of Applied Mechanics and Engineering, Waseda University</i>
9.20 AM	Dynamic evolution of rotating stall in a model pump-turbine during runaway transient scenario: three-dimensional simulation <i>Xiaoxi Zhang, Qihua Chen</i> <i>School of Environmental Science and Engineering, Xiamen University of Technology</i>
9.40 AM	Understanding the coherent structures for different fluctuation frequencies at partial load condition of a Francis turbine <i>Sun Guoyong, Jiang Bo, Wang Yuchuan, Liu Demin, Avellan François</i> <i>Dongfang Electric Machinery Co., Ltd</i>
	OCEAN HYDRO MACHINERY Chair: Prof. Stefan Riedelbauch
9.00 AM	Three-dimensional coupled design for runner blades and guide vanes of tubular turbine based on bidirectional flow control <i>Ji Qingfeng, Liao Weili, Jia Xin, Fan Honggang</i> <i>Institute of Water Resources and Hydro-electric Engineering, Xi'an University of Technology</i>
9.20 AM	Investigation of operating principle of diffuser augmented hydrokinetic turbines <i>Stadler Christa, Wack Jonas, Riedelbauch Stefan</i> <i>Institute of Fluid Mechanics and Hydraulic Machinery, University of Stuttgart</i>
9.40 AM	Research on Cooperative Control Algorithm for Vertical Conveyor System of Staged Slurry Pump Group <i>Jiang Xiaoping, Liang Hao, Wang Zhengwei</i> <i>Department of Energy and Power Engineering, Tsinghua University</i>
	PUMPED STORAGE 4 Chair : Prof. Eduard Eguisquiza
9.00 AM	Special Pressure Fluctuation analyse of the pump turbine <i>D M Liu, B Geng, H P He, J S Zheng, W C Liu, Q W Liang, Y Z Zhao</i>
9.20 AM	Nonlinear simulation of speed variation of variable-speed unit under large disturbance by Simulink <i>Yang Weijia, Huang Yifan, Yang Jiandong, Zhao Zhigao, Li Yulan, Ma Weichao, Jiebin Yang</i> <i>The State Key Laboratory of Water Resources and Hydropower Engineering Science, Wuhan University, China</i>
9.40 AM	A predictive governing control method of the pumped-storage unit based on lumped-parameter model equivalence <i>Zheng Yang, Chen Qijuan, Liu Wanying, Yan Donglin</i> <i>School of Power and Mechanical Engineering, Wuhan University, Wuhan</i>
10.00 AM	Research and application on numerical simulation of hydraulic transient process in complicated water conveyance system <i>Li Gaohui, Chen Shunyi, Dai Jiang, Zhou Tianchi, Zhang Lin</i> <i>Powerchina Huadong Engineering Corporation Limited, Zhejiang Hangzhou</i>
	NUMERICAL SIMULATIONS 6 Chair: Dr. Jean Decaix
9.00 AM	Simulation of the structural behavior of a Francis runner in Deep Part Load Operation <i>von Locquenghien Florian, Wack Jonas, Conrad Philipp, Jester-Zürker Roland, Riedelbauch Stefan</i> <i>Voith Hydro Holding GmbH & Co. KG</i>

30th IAHR Symposium on Hydraulic Machinery and Systems



9.20 AM	<p>Vortex rope mitigation with azimuthal perturbations: A numerical study <i>Holmström Henrik, Sundström Joel, Cervantes Michel</i> <i>Luleå University of Technology</i></p>
9.40 AM	<p>Dynamics of pressure pulsations in thin annular gap <i>Kůrečka Jan, Habán Vladimír, Himr Daniel</i> <i>Viktor Kaplan Department of Fluid Engineering, Faculty of Mechanical Engineering, Brno University of Technology</i></p>
10.00 AM	<p>Research on internal flow of gas - liquid two - phase flow in centrifugal pump based on dimensionless method <i>Zhang Haoyang, Qiaorui Si, Bois Gerard, Shouqi Yuan</i> <i>Research center of fluid machinery engineering and technology</i></p>

Thursday March 25 2021
Parallel Sessions 10.45AM – 12.30 AM CET

	HYDRAULIC TURBINES 13 Chair: <i>Chisachi Kato</i>
10.45 AM	Comparisons of vortical flow and cavitation inside a Francis turbine with different draft tubes <i>Geng Chen, Zhang Ruizhi, Tsujimoto Yoshinobu, Nishi Michihiro, Luo Xianwu</i> <i>Department of Energy and Power Engineering, Tsinghua University</i>
11.05 AM	Operation state evaluation of hydraulic turbine based on big data analysis <i>Xiaoping Jiang, Fan Gao, Le Liu, Yongyao Luo</i> <i>Nanjing Electric Technology Co., Ltd.</i>
11.25 AM	Research on Modeling and Control Strategy of Hydraulic Turbine Regulation System Based on GA-ELM Network <i>Jiang Xiaoping, Zhang Yunxiang, Luo Yongyao</i> <i>China University of Mining & Technology-Beijing</i>
11.45 AM	Numerical investigation of cavitating vortex rope in a single draft tube with Batchelor Vortex inlet <i>An YU, Qinghong Tang, Yifu Wang</i> <i>Hohai University</i>
12.05 PM	Investigation of the erosion characteristics in the distribution parts of Pelton turbine <i>HAN Lei, ZHANG Gaofu, WANG Hongjie, GONG Ruzhi, WEI Xianzhu</i> <i>Harbin Institute of Technology</i>
	SUSTAINABLE HYDRO 3 Chair: <i>Prof. Christian Bauer</i>
10.45 AM	Evaluation of the effects of shear stress on crucian carps passing through turbines <i>Meng Long, Wang Wanpeng, Li Tiejou, Liao Cuilin, Zhao Lice, Chen Ying</i> <i>China Institute of Water Resources and Hydropower Research</i>
11.05 AM	Francis turbines exposed to erosive conditions, causes and the concept of variable speed turbine as a mitigating measure <i>Neopane Hari P, Chitrakar Sailesh</i> <i>Department of Mechanical Engineering, Kathmandu University, Dhulikhel, Nepal</i>
11.25 AM	Quantifying the Effect of Kaplan-Type Runner Blade Gaps on Fish-related Flow Conditions <i>Romero-Gomez Pedro, Colotelo Alison, Weissenberger Simon</i> <i>ANDRITZ Hydro GmbH</i>
11.45 AM	Numerical Simulation and Experimental Verification of Downstream Fish migration in a Kaplan turbine <i>Benigni Helmut, Schneider Josef, Reckendorfer Walter, Jaberger Helmut, Zenz Gerald, Tuhtan J</i> <i>Institute of Hydraulic Fluidmachinery, Graz, University of Technology</i>
12.05 PM	Numerical Simulation and Research of the Axial Flow Fish-friendly Turbine in Plateau Area <i>Yang Chunxia, Xu Ding'e, Zhang Qianxu, Zhu Shuangju, Zhao Lei</i> <i>Hohai University</i>
	PUMPED STORAGE 5 Chair: <i>Alexandre Jung</i>
10.45 AM	An experimental platform of variable speed pumped storage unit under wave disturbance: introduction and preliminary progress <i>Weijia Yang, Jiandong Yang, Wei Zeng, Zhigao Zhao, Guiqiao Zheng, Tao Peng, Yifan Huang, Jinhong Hu, Zhenyu Zeng, Jiebin Yang, Xuewu Wang, Man Chen</i> <i>The State Key Laboratory of Water Resources and Hydropower Engineering Science, Wuhan University, China</i>
11.05 AM	Analysis of dynamic performance in a pump-turbine during the successive load rejection <i>Huili Bi, Funan Chen, Chao Wang, Zhengwei Wang, Honggang Fan, Yongyao Luo</i> <i>Department of Energy and Power Engineering, Tsinghua University</i>

11.25 AM	Parameter identification of Pumped storage hydro unit Regulation System Based on Improved Backtracking Search Algorithm <i>Jiang Xiaoping, Lei Jiayu, Wang Zhengwei</i> <i>Department of Electrical Engineering, China University of Mining & Technology, Beijing</i>
11.45 AM	A coordination controller in variable speed pumped storage plant <i>Zhao Zhigao, Yang Jiandong, Ma Weichao, Yang Weijia, Wang Xuewu, Peng Yumin, Yifan Huang</i> <i>State Key Laboratory of Water Resources and Hydropower Engineering Science, Wuhan University</i>
	GENERAL TOPICS Chair: <i>Dr. Ali Amini</i>
10.45 AM	Transfer learning for isolated cylinder vibration induced by vortex shedding <i>Miao Yang, Jiang Yuncheng, Zhang Xiaolu, Li Kun</i> <i>College of Mechanical Engineering and Applied Electronics Technology, Beijing University of Technology</i>
11.05 AM	Numerical investigation on the pulsation source inside an elbow-type draft tube of a pumped storage project <i>Huang Ping, Fang Yujian, Chen Hongjun, Zhang Jinfeng, Yuan Shouqi</i> <i>Jingjiang College, Jiangsu University</i>
11.25 AM	A novel hydraulic turbine governing system based on digital cartridge valve technology <i>Wang Cong</i> <i>China Institute of Water Resources and Hydropower Research</i>
11.45 AM	Risk allocation, interface management and other key issues of a hydro power plant erection contract <i>Geisseler Bettina</i> <i>GEISSELER LAW</i>