

15th International Conference "Experimental Fluid Mechanics" (EFM21)

EPJ Web of Conferences Volume 264 (2022)

Liberec, Czech Republic
23-26 November 2021

ISBN: 978-1-7138-5738-9

Printed from e-media with permission by:

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



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

This work is licensed under a Creative Commons Attribution 4.0 International License. License details:
<http://creativecommons.org/licenses/by/4.0/>.

No changes have been made to the content of these proceedings. There may be changes to pagination and minor adjustments for aesthetics.

Printed with permission by Curran Associates, Inc. (2022)

For additional information, please contact EDP Sciences – Web of Conferences at the address below.

EDP Sciences – Web of Conferences
17, Avenue du Hoggar
Parc d'Activité de Courtabœuf
BP 112
F-91944 Les Ulis Cedex A
France

Phone: +33 (0) 1 69 18 75 75
Fax: +33 (0) 1 69 28 84 91

contact-edps@webofconferences.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

Ultrasonic Methods for Determining Flows and Velocity Fields	1
<i>Veronika Barraclough, Jan Cizek, Miroslav Strob, Jan Novosad, Jaroslav Pulec, Petra Dancova</i>	
An Experimental Analysis of Droplet Charging in a Wind Tunnel.....	9
<i>Ondrej Bartos, Adam Hunek</i>	
Validated Numerical Simulation of Airflow in Child Respiratory Airways.....	13
<i>Miloslav Belka, Milan Maly, Ondrej Cejpek, Jakub Elcner, Frantisek Lizational, Jan Jedelsky, Miroslav Jicha</i>	
Dual-Capillary Dilatometer for Density Measurements of Supercooled Water	18
<i>Ales Blahut, Jiri Hykl, Pavel Peukert, Jan Hraby</i>	
Polymeric Hollow Fibers: A Modular Heat Exchanger for Thermal Management Systems of Battery Modules in Electric Vehicles	24
<i>Jan Bohacek, Jiri Hvozda, Krystof Mraz, Alexander Vakhrushev, Ebrahim Karimi-Sibaki</i>	
High-Speed Temperature Measurement	29
<i>Patrik Bouchal, Jiri Hejcik, Miroslav Jicha</i>	
Spray in Cross-Flow: Comparison of Experimental and Numerical Approach	33
<i>Ondrej Cejpek, Milan Maly, Miloslav Belka, Jaroslav Slama, Ondrej Hajek, Frantisek Prinz, Jan Jedelsky</i>	
New Measurement Method for In-Field Measurements of Liquid Phase Drift from Cooling Towers.....	40
<i>Jan Cizek, Veronika Barraclough, Jiri Houzvicka, Martin Dostal, Pavel Prochazka, Vaclav Uruba</i>	
Two-Wavelength Digital Holographic Interferometry for Unambiguous Range Extended Measurements in Fluid Mechanics	48
<i>Gramoz Cubreli, Pavel Psota, Ahmad Kouta, Petra Dancova</i>	
Pool Boiling Heat Transfer on Minichannels with Porous Structure.....	55
<i>Norbert Dadas, Robert Pastuszko, Robert Kaniowski</i>	
Simcenter STAR-CCM+ Software for CFD and Heat Transfer Calculations in Minichannels	59
<i>Norbert Dadas, Artur Piasecki, Magdalena Piasecka</i>	
2D Numerical Investigation of Liquid Dispersion in Rotating Packed Bed and Its Comparison with Experimental Measurements Using High-Speed Camera.....	63
<i>Jakub Elcner, Ondrej Hajek, Miroslav Jicha</i>	
Pollutant Dispersion in a Group of Courtyard Buildings.....	67
<i>Simone Ferrari</i>	
Ventilation in a Group of Courtyard Buildings	73
<i>Simone Ferrari</i>	
Analysis of Velocity Distribution in an Air Flow Through a Thin Perforated Plate	79
<i>Adam Groma, Adam Kazda, Michal Kotek, Darina Jasikova, Adam Kure</i>	

A Dispersion of a Droplet Flow on Crossing Wires in an Air Counterflow	85
<i>Ondrej Hajek, Ondrej Cejpek, Milan Maly, Frantisek Prinz, Miroslav Jicha</i>	
CFD Investigation of the Test Facility for Forced Blade Flutter Research	90
<i>Jindrich Hala, Jan Lepicovsky, Petr Sidlof, David Simurda</i>	
Fluid Flow Measurement in Air Ducts Under Unsteady Flow Conditions - Fundamentals	94
<i>Ludek Jancik, Petra Dancova</i>	
Software-Based Processing System for Phase Doppler Systems.....	98
<i>Jan Jedelsky, Milan Maly, Ondrej Cejpek, Graham Wigley, James F. Meyers</i>	
High Optical Quality Models for Flow Visualization and PIV Measurement.....	104
<i>Milos Kasperek, Ludmila Novakova</i>	
Experimental Investigation of Homogeneous Nucleation of Water in Various Gases Using an Expansion Chamber.....	108
<i>Tetiana Lukianova, Mykola Lukianov, Jan Hraby</i>	
Optimization of the Continuity of the Aspherical Production Processes in Asphericon s.r.o Based on Subsurface Damage and Microroughness Analysis.....	113
<i>Ondrej Matousek, Karolina Sedlackova, Vladislav Kuryshev</i>	
Nebulizer Particle Size Distribution Measured by Various Methods	120
<i>Ondrej Misik, Andrea Pestalova, Miloslav Belka, Frantisek Lizal</i>	
Dynamic Behaviour of Cavitation Bubble Close to a Flexible Wall	124
<i>Milos Muller, Jan Hujer, Petra Dancova</i>	
CFD Analysis of the Ultrasonic Gas Meter Channel.....	128
<i>Jan Novosad, Jaroslav Pulec, Petra Dancova, Tomas Vit</i>	
Optimization of Air Mass Flow in a PEM Fuel Cell	133
<i>Jan Novotny, Ludmila Novakova, Roman Cizek, Milos Kasperek, Ilona Machovska</i>	
Experimental and Numerical Study of Natural Convection in 3D Double Horizontal Annulus	138
<i>Jan Perez, Adam Tater, Jiri Polansky, Tomas Vampola</i>	
Pool Boiling of Novec-649 on Minichannels Filled with Copper Foam	146
<i>Robert Pastuszko, Norbert Dadas, Robert Kaniowski</i>	
Advances in Simulations of Heat Exchange in Fluid Flows by High-Order Methods	150
<i>Jan Pech</i>	
Lattice Boltzmann Simulation of the Air Flow Through the Children Respiratory Tract	155
<i>Frantisek Prinz, Jan Pokorny, Jakub Elcner, Miroslav Jicha</i>	
Lift Measurement of Airfoil AH93-157 from Wall Pressure Distribution	161
<i>Pavel Prochazka, Vladislav Skala, Pavel Antos, Lukas Popelka, Jiri Furst, Michal Schmirler</i>	
On the Stall Flutter Occurrence in a Blade Cascade Set to Turbine and Compressor Geometry	165
<i>Pavel Prochazka, Pavel Snabl, Sony Chindada, Ondrej Bublik, Vaclav Uruba</i>	
Design and Testing of the Supporting Setup for the High-Pressure Vibrating Tube Densimeter	172
<i>Olga Prokopova, Miroslav Censky, Ales Blahut, Vaclav Vins</i>	

Quantitative Schlieren Imaging Based on Fringe Projection.....	180
<i>Pavel Psota, Marek Stasik, Jan Kredba, Vit Ledl, Darina Jasikova, Michal Kotek, Vaclav Kopecky</i>	
Experimental Investigation of the Wake Behind a Cooled Cylinder.....	185
<i>Jaroslav Pulec, Petra Dancova, Vaclav Vins</i>	
Preliminary Measurements of the Thermal Field in a Rectangular Channel by the Planar Laser-Induced Fluorescence Method.....	191
<i>Jaroslav Pulec, Pavel Mony, Vaclav Vins, Petra Dancova</i>	
Survey of Experimental Channels Employed on Investigation of a Non-Isothermal Laminar Flow and Design Requirements for a New Experiment	195
<i>Jaroslav Pulec, Petra Dancova, Vaclav Vins</i>	
Automatic Field Measurement of Groundwater Discharges in a Tunnel	200
<i>Petr Ralek, Milan Hokr, Lubomir Slavik, Ales Balvin</i>	
CFD Analysis of an Anemometric Sensor Design for Air Flow Measurement in a Heat Exchanger	208
<i>Jan Sedlacek, Michal Kus, Miroslav Strob, Richard Matas</i>	
Feasibilities of Foam-Forming Bacteria Disintegration by Ultrasonic Atomization	212
<i>Petr Schovanec, Darina Jasikova, Michal Kotek, Karel Havlicek, Jakub Eichler</i>	
Aerodynamic and Dynamic Loading in a Blade Cascade Designed for Flutter Research.....	216
<i>Petr Sidlof, David Simurda, Jan Lepicovsky, Martin Stepan</i>	
Pressure Losses Reduction in a Steam Turbine Compact Valve	220
<i>Vaclav Slama, David Simurda, Ladislav Tajc, Bartolomej Rudas, Jindrich Hala, Martin Luxa, Tomas Radnic</i>	
Counter Flow Atomizer: Effect of the Area Ratio of the Outlet Orifice and the Inlet Air Canal	224
<i>Karolina Smutkova, Milan Maly, Ondrej Cejpek, Jan Jedelsky</i>	
Development of a 10 kW Class Axial Impulse Single Stage Turboexpander for a micro-CHP ORC Unit.....	229
<i>Jan Spale, Guk Chol Jun, Vaclav Novotny, Philipp Streit, Andreas P. Weiß, Michal Kolovratnik</i>	
Conception of Minichannel Cooling for a PVT Heat Exchanger	236
<i>Dariusz Strak, Magdalena Piasecka</i>	
On Dynamics of the Flow in Gap Between Two Buildings in Tandem Configuration	243
<i>Vaclav Uruba, Pavel Prochazka, Vaclav Svoboda, Renata Gnatowska</i>	
Contribution on the Kinematics of the Polishing Process on a Polishing Machine with Horizontal Overarm.....	249
<i>Lukas Vesely, Ondrej Matousek, Tomas Vit, Milos Muller</i>	
Optimization of the Polishing Process on a Polishing Machine with Horizontal Overarm	253
<i>Lukas Vesely, Ondrej Matousek, Tomas Vit, Jan Novosad</i>	
Experimental Set Up for the Investigation of Partial Phase Changes of Phase Change Materials	258
<i>Martin Zalesak, Patrik Bouchal, Milan Ostry, Jiri Hejcik</i>	

Author Index