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Editorial

Selected Papers from the XI International Conference on Computational Heat, Mass and Momentum Transfer (ICCHMT 2018)

Jan Taler [1,*], Paweł Ocłoń [1], Marcin Trojan [1] and Abdulmajeed Mohamad [2]

[1] Department of Energy, Cracow University of Technology, Al. Jana Pawła II 37, 31-864 Cracow, Poland; poclon@mech.pk.edu.pl (P.O.); marcin.trojan@pk.edu.pl (M.T.)

[2] Mechanical and Manufacturing Engineering, SSE, University of Calgary, 2500 University Drive, NW, Calgary, AB T2N 1N4, Canada; mohamad@ucalgary.ca

* Correspondence: taler@mech.pk.edu.pl; Tel.: +48-12-628-35-54

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1. Introduction

Energies presents 10 papers selected from the 11th International Conference on Computational Heat, Mass and Momentum Transfer (ICCHMT2018). The Conference was held in Cracow, Poland, in 21–24 May 2018. The conference has been organized successfully for over 18 years in many countries including Cyprus, Brazil, Canada, France, China, Turkey, South Korea, and Poland.

During the ICCHMT2018, over 300 participants presented their works during the oral, poster, and keynote sessions. The following countries were represented: Poland, China, India, Ukraine, England, South Korea, USA, Romania, Germany, Australia, Sweden, France, Canada, Japan, Brazil, Russia, Finland, Belarus, Italy, and Slovenia. In total, 24 oral sessions, four Keynote sessions, and three poster sessions were performed. The Keynote Lectures were presented by world-recognized experts in energy engineering and heat transfer: Prof. Qiuwang Wang, Dr. Mustafa Mohamad, Prof. Ulrich Gross, Prof. Pradeep Bansal, Prof. Kamel Hooman, Prof. Jiří Jaromír Klemeš, Prof. Bozidar Sarler, Prof. Jean Taine, Prof. Sang-Ho Suh, Prof. Li-Zhi Zhang, and Prof. Zhiguo Qu.

The ICCHMT2018 conference topics related to energy engineering were:

- Energy systems simulation,
- thermal energy storage,
- fluid machinery simulation
- turbulent flow simulation,
- convection heat transfer,
- inverse heat transfer and optimization in thermal engineering,
- combustion modelling, and
- enhanced heat transfer and heat exchangers.

2. Special Issue Content

The Special Issue presents 10 papers related to energy engineering. Mohamad et al. [1] developed a modified Tromble wall system. The system utilizes a water tank, which is part of the building's wall, for storage and hot water supply. The proposed passive system can be used for heating a room in the day and if the heat is available in excess, at night too. The mathematical model of a modified Tromble wall is simplified and efficient, and can be used for performance evaluation of energy systems. Kim et al. [2] analyzed the flow of the tip clearance and its effect on Kaplan turbine performance as well as hydraulic efficiency, to improve the understanding of the flow field in a Kaplan turbine. Grądziel

and Majewski [3] presented the results of experimental testing performed to determine the friction factor in an internally rifled tube with helical ribs. The experimental correlation for the calculation of the pressure drop in an internally rifled tube can be used in the design of this kind of energy system components. Jaremkiewicz et al. [4] developed a new measurement technique for determining a transient fluid temperature under high pressure. The new thermometer was designed to be used to measure the steam temperature in power plants. Slonski and Schrag [5] described a conceived method for planning quarters and settlements. The novelty of this work emerges from the combination of a building simulation with a linear economic optimization of the energy system, to achieve the energy-plus house standard for a settlement. Vallati et al., [6] developed a numerical model for small size storage unit called GLES, environmentally sustainable, to exploit the higher efficiency of the liquid pumping to compress air. The GLES system with liquid spray atomization was proposed to improve the efficiency of the compressed-air energy storage system. Zhang et al. [7] studied a time-varying high-intensity heat flux for a two-layer hollow cylinder. In order to monitor the thermal state of a gun barrel, an inverse method coupling the finite difference method with the sequential function specification method was developed to estimate the unknown time-varying heat flux imposed on the inner wall of a gun barrel. The results show that the proposed method has high precision and efficiency in extracting the time-varying heat flux under one-shot and three-shot firing conditions. Zhang and Yang [8] developed a one-dimensional fluid model for the simultaneous desulfurization and denitrification of flue gas by negative direct current (DC) corona discharge based on the traditional zero-dimensional chemical kinetic model.

Zarzycki et al. [9] presented a concept and calculations concerning the operation of the direct carbon fuel cell (DCFC) with molten hydroxide electrolyte (MH-DCFC) as the basic source of electricity integrated with heat and cool air generation systems. The maximum heat and cool streams that can be obtained during the operation of the fuel cell were also evaluated. Kumar et al. [10] presented a review on performance evaluation of a solar air heater using different shaped ribs on the absorber plate.

3. Closing Remarks and Future Challenges

The articles cover the application of numerical methods in energy storage, fluid flow machinery, fuel cells, experimental techniques, inverse heat conduction problems, and energy savings. Therefore, the presented papers have a practical importance in energy engineering.

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Conflicts of Interest: The authors declare no conflict of interest.

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