



HAL
open science

Special issue on IMAT/ICSERA conferences in 2021

Patrice Estellé, Ummikalsom Abidin, Natrah Kamruzaman, Normah
Mohd-Ghazali

► **To cite this version:**

Patrice Estellé, Ummikalsom Abidin, Natrah Kamruzaman, Normah Mohd-Ghazali. Special issue on IMAT/ICSERA conferences in 2021. *Journal of Thermal Analysis and Calorimetry*, 2023, 10.1007/s10973-023-11971-2 . hal-03959291

HAL Id: hal-03959291

<https://hal.science/hal-03959291>

Submitted on 27 Jan 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Special Issue about IMAT/ICSERA conferences in 2021

Patrice Estellé *, **Ummikalsom Abidin**, **Natrah Kamruzaman**, **Normah Mohd-Ghazali ^y**

Univ Rennes, LGCGM, F-35000 Rennes, France

Faculty of Mechanical Engineering, Universiti Teknologi Malaysia, 81310 Johor Bahru, Johor, Malaysia

Corresponding authors: * patrice.estelle@univ-rennes1.fr ; ^y normah@mail.fkm.utm.my



Patrice Estellé
Univ Rennes, LGCGM,
France
Associate Editor JTAC



Ummikalsom Abidin
Faculty of Mechanical
Engineering, Universiti
Teknologi Malaysia



Natrah Kamruzaman
Faculty of Mechanical
Engineering, Universiti
Teknologi Malaysia



Normah Mohd-Ghazali
Faculty of Mechanical
Engineering, Universiti
Teknologi Malaysia
Chair of ICSERA 2021

The International Meeting on Advances in Thermofluids (IMAT) is an initiative to bring together academicians, research scientists, and all interested parties from all over the world in a common platform to foster discussion, exchange ideas for the exploration of future research in the fields of fluid mechanics, heat transfer, thermodynamics, combustion, and all topics related to thermal fluids. IMAT has been conducted annually since 2008, held on a rotational basis between Universiti Teknologi Malaysia (UTM), National University of Singapore (NUS), and Universitas Indonesia (UI) with Kyushu University joining in 2019.

Meanwhile, the International Conference on Saving Energy in Refrigeration and Air-Conditioning (ICSERA), which started in 2009, is held every two years. The conference is a continuous effort to address issues related to effective and efficient energy use in the air-conditioning and refrigeration industry, a major contributor to increasing energy demand and environmental impact. Under the umbrella of the Society of Air-conditioning and Refrigerating Engineers of Korea (SAREK), ICSERA is either held in Korea or Indonesia with UTM hosting for the first time in 2021. The Hanoi University of Science and Technology in Vietnam hopes to hold the 8th ICSERA sometime in July or August of 2023 while the date and venue for the 13th IMAT is yet to be determined.

During the last conferences in 2021, both organized by UTM, it was decided on the proposal of P. Estellé, an Associate Editor in JTAC and invited speaker in the ICSERA conference, to select the best papers presented in both conferences for possible publication in JTAC as a Special Issue. Among these selected papers, and after the regular and rigorous review process, the following original articles have been finally published.

The first paper, by Hidayat Mat *et al.* [1], reports a CFD numerical simulation of the fluid flow of boron nitride nanotube nanofluid in a microchannel heat sink at 30 and 50 °C

compared to water and base fluid containing surfactant. Similar boron nitride nanotube nanofluids, at various mass content, were investigated in [2] to simultaneously minimize the thermal resistance and pressure drop in a rectangular microchannel heat sink and improve its overall performance using multi-objective genetic algorithm (MOGA).

In [3], Tan *et al.* examined from a CFD analysis the efficiency of a ceiling-mounted air curtain in reducing particle distribution in a surgical zone considering different air supply diffusers and air curtains combinations. In the paper from Yu *et al.* [4], the effects of various temperatures and humidity ratios of regeneration air on the performance of a desiccant dehumidifier using a polymer as an adsorbent are investigated considering the adsorption/desorption amount, average moisture removal capacity, and latent energy ratio of the regeneration process as key performance indexes. The performance of an adsorption heat transformer cycle was analysed in [5] for possible applications in the waste heat upgrade and thermal desalination. Based on an equilibrium model developed using adsorption characteristics and isotherm data, five types of commercially available silica gels and three types of zeolites were studied as adsorbents.

Three other papers deal with combustion problems. In the first one, the one-step irreversible Arrhenius kinetics is applied to numerically describe the biogas supersonic combustion, well known as detonation, with nitrogen (N_2) dilution. The three model parameters including the temperature exponent n , the activation energy E_a , and the pre-exponential factor A_f is used to describe biogas detonation velocities [6]. The second article in this field, from Selvam *et al.* [7], investigates both combustion and flow characteristics inside a modified trapped vortex combustor, characterised by a variable guide vane ratio between length of column guide vane inside the cavity and height of the cavity, for improving the performance and reduce the NOx emission. The Arrhenius rate of the one-step methane/air reaction mechanism was considered in this study, as well as the effect of the incoming velocity. The laminar burning velocity, hydrodynamic instability, and diffusive–thermal instability of biogas/ N_2O oxide were experimentally and numerically studied at different equivalence ratios by Elhawary *et al.* [8]. The spherical propagating premixed flames for various mixtures of biogas- N_2O were determined in this study using the constant volume combustion vessel at 303 K and atmospheric pressure considering two mechanisms to estimate the predicted combustion characteristics of biogas/ N_2O mixtures.

Also, Azmi and Padzillah [9] analysed the effect of volute aspect ratio on the secondary flow characteristics of a mixed flow turbine volute at different operating conditions. The flow characteristics were analysed for four-volute designs with constant volute area-to-centroid radius ratio (A/r) and different volute aspect ratio. Finally, the last paper of this SI, is dedicated to the prediction of the boiling heat transfer coefficient of R32 inside a horizontal multiport mini-channel tube from both experiments and artificial neural networks modelling [10].

We hope that these contributions will be useful for the scientific community. Finally, we would like to thank again JTAC for agreeing to publish this special issue and the assistance of S. Korda in managing this SI. Last, we encourage researchers in the field of thermofluids and energy in refrigeration and air-conditioning to participate in the next IMAT & ICSEA conferences for sharing new results and extending their network with new partners in Asia.

References

1. Hidayat Mat MN, Mohd- Ghazali N, Shamsuddin HS, Estellé P, Thermofluid behaviour of boron nitride nanotube nanofluid in a microchannel under optimized conditions, Journal of Thermal Analysis and Calorimetry, <https://doi.org/10.1007/s10973-022-11472-8>
2. Nabihah Yusof NL, Shamsuddin HL, Estellé P · Mohd- Ghazali N, Optimization of a boron nitride nanotubes nanofluid- cooled microchannel heat sink at different concentrations, Journal of Thermal Analysis and Calorimetry, <https://doi.org/10.1007/s10973-022-11545-8>
3. Tan H, Wong KY, Lee CT, Wong SL, Nyakuma BB, Wahab RA, Lee KQ, Chiong MC, Ho WS, Dzarfan Othman MH, Yau YH, Kek HY, Kamar HM, Numerical assessment of ceiling- mounted air curtain on the particle distribution in surgical zone, Journal of Thermal Analysis and Calorimetry, <https://doi.org/10.1007/s10973-022-11466-6>
4. Yu H, Seo SW, Mikšík F, Thu K., Miyazaki T, Choon Ng K, Effects of temperature and humidity ratio on the performance of desiccant dehumidification system under low- temperature regeneration, Journal of Thermal Analysis and Calorimetry, <https://doi.org/10.1007/s10973-022-11368-7>
5. Saren S, Mitra S, Miyazaki T, Choon Ng K, Thu K, Adsorption heat transformer cycle using multiple adsorbent + water pairs for waste heat upgrade, Journal of Thermal Analysis and Calorimetry, <https://doi.org/10.1007/s10973-022-11350-3>
6. Rahman MR, Ujir MH, Wahid MA, Mohd Yasin MF, A single- step chemistry mechanism for biogas supersonic combustion velocity with nitrogen dilution, Journal of Thermal Analysis and Calorimetry, <https://doi.org/10.1007/s10973-022-11356-x>
7. Selvam DS, Rahim NA, Saad MR, Syawal S, Mohd Faizal H, Abdul Rahman MR, Numerical simulation of a modified trapped vortex combustor, <https://doi.org/10.1007/s10973-022-11382-9>
8. Elhawary S, Saat A, Wahid MA, Md Zain MZ, Effect of nitrous oxide on laminar burning velocity, hydrodynamic, and diffusive–thermal instability of biogas combustion, <https://doi.org/10.1007/s10973-022-11408-2>
9. Azmi A, Padzillah MH, Secondary flow structure characteristics of an automotive mixed flow turbocharger turbine volute at different aspect ratios, <https://doi.org/10.1007/s10973-022-11637-5>
10. Agustiarini N, Hoang HH, Oh J-T, Mohd- Ghazali N, Application of machine learning to the prediction of the boiling heat transfer coefficient of R32 inside a multiport mini- channel tube, <https://doi.org/10.1007/s10973-022-11602-2>