Research Grants for PhD students from the China Scholarship Council

Information Form (please read the guidelines carefully on the website www-csc.utt.fr)

Supervisor's name : GOMES | Given names : Samuel

Status (prof., assistant prof., …) : Prof.

Laboratory :	Laboratoire Interdisciplinaire Carnot de Bourgogne, UMR 6303 CNRS, ICB-COMM	Website address :	http://icb-comm.utbm.fr/
Institution :	Université de Bourgogne Franche-Comté - UTBM	Website address :	www.utbm.fr

Scientific competence of the supervisor:

- Conception en mécanique, Génie industriel
- Modélisation des procédés
- Ingénierie des systèmes complexes
- Optimisation des procédés

Two major publications in the field proposed for the PhD :

1. N. Lebaal, A. Settar, S. Roth, S. Gomes, Conjugate heat transfer analysis within in lattice-filled heat exchanger for additive manufacturing, Mech. Adv. Mater. Struct. (2020) 1–9.
2. M. Ferhi, R. Djebali, S. Abboudi, H. Kharroubi. Conjugate natural heat transfer scrutiny in differentially heated cavity partitioned with a conducting solid using the lattice Boltzmann method. J Therm Anal Calorim 138,

Website address of the personal page :

Supervisor's email : samuel.gomes@utbm.fr

Description of the research work proposed for a PhD ***Topic # (see list) :*** V-4

Title : Numerical Analysis and Optimization of advanced Heat Transfer in Porous Lattice Structures

Subject :

Heat exchangers (HEs) are critical industrial equipment designed for thermal management, enabling heat transfer between hot and cold fluids. They play a pivotal role in developing contemporary industrial technologies. Compact heat exchangers have emerged as one of the most sophisticated cooling techniques available today.
Advanced manufacturing processes has opened new frontiers, particularly in utilizing lattice structures as porous media a remarkably effective approach to thermal dissipation. The primary objective of these innovative structures is to transmit heat between hot and cold zones by simultaneously leveraging two fundamental thermal phenomena: heat conduction and convection.
Numerical simulation of this conjugate heat transfer can be modeled through two approaches: the porous media model and the real physical model. The research aims to optimize lattice configurations within heat exchangers to significantly enhance their thermal efficiency.
Due to computational constraints limiting full-scale numerical simulations of 3D lattice structures, the porous media model methodology emerges as a particularly robust approach for heat exchanger numerical modeling. Through sequenced numerical simulations of the lattice structure configuration model, it becomes possible to derive viscous

Keywords :

New advanded process, heat exchanger, porous media, numerical modeling, optimization

Expected collaborations :

Cosupervisors: Nadhir Lebaal and Said Abboudi
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Background required from the applicant :

Mathematical modeling, CFD analysis, heat transfer, optimization methods

Existence of a PDF file detailing the proposal ("yes" or "no") : yes

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