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 : Abboudi | Given names : Said

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:

- Computational fluid dynamic
- Direct and inverse heat transfer problems
- Finite, volume, difference and element methods and numerical implementation
- Heat exchanger
- Thermo-mechanical analysis of structures

Two major publications in the field proposed for the PhD :

1. 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,
2. H. Benzenine, R. Saim, S. Abboudi, et al.Three-dimensional analysis of heat transfer in a channel provided with solid baffle, single and double perforation: A heat exchanger application. Int Jour. of Num. Meth. for Heat &

Website address of the personal page :

Supervisor's email : said.abboudi@utbm.fr

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

Title : Development of lattice structures for highly efficient heat exchangers

Subject :

This thesis aims to develop new metallic structures for thermal components. Increasing the heat transfer between a fluid and a thermal system can help for saving energy resource, preventing undesirable thermal degradation or improving the efficiency of thermal exchangers. Such achievements foster the research of manufacturable solutions. We suggest to work in that direction. The PhD works will consist in finding various efficient structures that can improve the heat transfer between an incompressible fluid flow and structures. New structures will be designed and optimized depending on the conjugate heat transfer with the fluid. This work includes analytical approaches to find out objective functions we can rely on for a good parameter selection. The optimization task will be coupled with a Multiphysics simulation using finite element and/or finite volume codes (Comsol and Ansys softwares), and virtual tests will be performed to identify some optimal heat transfer devices with general guidance about both heating and flow conditions for an efficient conjugate heat transfer.

Keywords :

New metal structure, heat exchanger, modeling, CFD, optimization

Expected collaborations :

Collaboration: N. Lebaal, R.N. Raoelison
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Background required from the applicant :

Mathematical modeling, CFD analysis, convective heat transfer, optimization methods

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

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