

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 : Lafon and Panicaud Given names : Pascal and Benoit

Status (prof., assistant prof., ...): Full professors

Laboratory : LASMIS Website address : <http://utt.lasmis.fr/fr/index.html>

Institution : UTT Website address : www.utt.fr

Scientific competence of the supervisor:

For supervisor 1:

Mechanical engineering ; Optimization methods for mechanics ; numerical simulation

For supervisor 2:

Micromechanics ; Damage mechanics ; Theoretical modelling ; Materials science

Two major publications in the field proposed for the PhD :

1. [Empty box]

2. [Empty box]

Website address of the personal page : [Empty box]

Supervisor's email : pascal.lafon@utt.fr

Description of the research work proposed for a PhD Topic # (see list) : IV-6 and VI-1

Title : On the effect of anisotropy on the mechanical behavior of microstructure and structure obtained with additive manufacturing

Subject :

The main objective of this PhD proposal is to study the propagation of anisotropy's effect in mechanical behavior from the microscopic scale until the scale of the structure. In this research, the work can be planned in three main phases:

- As a first step, anisotropy will be considered in mechanical behavior at different scales (microstructure and/or structure). Elasticity and elasto-plasticity will be addressed as material behaviors. Specific geometries will be designed to obtain a significant influence of the anisotropy of constituent shapes and orientations.
- As a second step, the correlation between both aspects (anisotropy and heterogeneity) and the transition toward scale (until the scale structure) will be considered. The assumption of the existence of some damping effect due the transition from the scale of microstructure to the scale of the structure will be addressed.
- As a third step, an experimental confrontation could be considered, using some facilities of LASMIS. Additive manufacturing processes could be used to produce some structure for which we could control anisotropy and heterogeneity at a micro/meso scale. Then using tensile and/or torsion test machine, the effect of anisotropy and heterogeneity at the scale of structure could be evaluated.

Keywords :

anisotropy ; heterogeneity ; Saint Venant 's principle ; additive manufacturing processes

Expected collaborations :

Background required from the applicant :

mechanical engineering ; mathematical analysis

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

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