

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 : Given names :

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

Laboratory : Website address :

Institution : Website address :

Scientific competence of the supervisor:

- Mechanical and material science
- Characterization of structures, phases and properties, modelling and computational analysis.
- Multiphysics modelling and simulation of thermal processes.

Two major publications in the field proposed for the PhD :

1.
2.

Website address of the personal page :

Supervisor's email :

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

Title :

Subject :

The Plasma Transferred Arc (PTA) process involves complex thermal-fluid interactions, rapid solidification and powder injection dynamics, making it challenging to depict without computational tools. This PhD thesis focuses on developing a multi-physics simulation framework to accurately model the PTA process, including those complex interrelated phenomena. By integrating molten pool dynamics with the plasma arc interaction, the model is expected to predict the influence of key process parameters such as arc current, plasma gas flow, traverse speed, and powder feed rate on deposit features. Experimental validation will be performed to calibrate and refine the simulation models, comparing predicted temperature fields, pool geometries, and microstructures with observed results. The expected outcome is a validated, high-fidelity simulation tool that enables the depiction of PTA parameters providing both a deeper understanding of plasma-powder-metal interactions and practical guidelines. By reducing the reliance on extensive trial-and-error experimentation, this research not only reduces the rebuttal tests but also contributes to greater environmental responsibility, promoting more sustainable practices.

Keywords :

Expected collaborations :

Background required from the applicant :

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

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