

Post-doc position

Subject: Combustion assisted by pulsed gliding arc

Work locations: GREMI UMR 7344 - ICARE CNRS UPR 3021, Orléans

Source of funding: CAPRI APR IR project

Starting date: September 2020

Contract duration: 1-year, possible extension

Net salary : ~ 1950 € /m



Contacts:

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Description

The study is part of the CAPRI project (APR IR region Center-Val de Loire) "Plasma Assisted Combustion: Research and Innovation" aimed at improving the energy efficiency of industrial burners. This project, combining electrical energy with combustion, is based on the development and installation of an innovative "pulsating gliding arc" plasma system within a combustion chamber. The development of this experimental system has two main objectives: - the improvement of flame stability, in particular in the case of lean mixture conditions and/or in turbulent regime, through the creation of reactive species; - control of pollutant emissions (NO_x, CO, soot particles) and greenhouse gases (CO₂ and CH₄). The envisaged system required the development of an impulse power supply adjustable in voltage and frequency and a burner adapted for generating the plasma. The objective of this project is to study the performance of such a system by considering the whole process, from the electrical supply of the plasma to the characterization of the pollutant emissions produced by combustion. This project associates an industrialist (BRANDT FRANCE, cooking R&D) with three research laboratories (GREMI, ICARE, GREMAN).

Tasks

The post-doctorate will take place in GREMI and ICARE laboratories in Orléans France. The study will begin by understanding and optimizing the "pulsed gliding arc" and then by its action on flames. The work includes the following tasks:

- Bibliographic study on plasma assisted combustion, in particular of gliding arc type
- Characterization of the pulsed gliding arc as a function of electrical and dynamic parameters at GREMI
- Getting started and testing the ICARE combustion installation
- Installation of the gliding arc system within the combustion device
- Plasma-combustion experiments using laser diagnostics and spectroscopy
- Analysis and processing of results, writing reports and articles
- Participation in project progress meetings

Candidate profile

Applicants must have a Ph.D. in Mechanical Engineering with a specialty of plasma and/or combustion. Skills in diagnostic optics and spectroscopy for reactive flows are necessary. Experience in conducting experiments in combustion or plasma is appreciated.

How to apply

Email to pablo.escot@univ-orleans.fr and toufik.boushaki@cnrs-orleans.fr

- CV,
- Cover letter,
- References, if applicable.