Labex MEC “Mechanics And Complexity”

Post-Doctoral position offer

Duration: 1 year

Period: From 1st trimester 2017

Location: Marseille, France

Gross salary: from 2423 € to 2843 €/month
depending on qualification and experience

Research project and job description

Title: Chemo-physical evolution modelling under cyclic thermomechanical loading of elastomers

Summary:

Elastomers undergoing cyclic thermomechanical loading may be involved in complex chemo-physical phenomena. Important implications is that the mechanical behavior will evolve in consequence: stiffening or softening. This can be interpreted as thermal aging that is due by, on the one hand, a temperature increase generated by self heating, and in the other hand, the local mechanical state (concurrence between damage and stiffening). A good comprehension of it and its modeling are essential to accurately predict the long term macroscopic behavior. The aim of this work is, first, to propose unsteady chemo-physical models involved in this kind of behavior, second, to embed them into a multiphysics formalism including numerical simulation, and to propose new experimental devices to both validate the models and enrich them. The major scientific stakes concern the design and the realization of experiments for coupled aspects and the design of highly coupled constitutive models involving a low number of parameters.

Job description:

The candidate is intended to strengthen modeling aspects and associated numerical developments. He will develop the material’s knowledge at small scales when multiphysical phenomena are concerned. He will have to develop collaborations with physicists and chemists, experts in polymers. He will be in charge to bridge both, the local physical/chemical state to the global macroscopic behavior at the scale of interest for the mechanical engineering. The high potential candidate will have a strong knowledge in chemo-physical aspects in polymers and constitutive modelling of elastomers. The research will be carried out at the Laboratoire de Mécanique et d’Acoustique CNRS UPR7051 (Aix-Marseille University, Centrale Marseille).

Essential skills:

Dynamical constitutive law modelling of elastomers, chemo-physics in polymers.

Desired skills:

Numerical modelling of elastomers.

Labex team Axis, action, part : Heterogeneity, multiscale, scale changes Action: Heterogeneity, homogenization and multiphysics

Contact: Name, surname: Eyheramendy Dominique et Stéphane Lejeunes

Mail : dominique.eyheramendy@centrale-marseille.fr et lejeunes@lma.cnrs-mrs.fr
Phone : +33 (0)4 84 52 56 26 et +33 (0)4 84 52 55 97

How to apply

Send an application including:

- A detailed CV with a list of publications
- A cover letter
- A list of scientific personalities able to comment on the application

to both these addresses:

Relevant group leader (dominique.eyheramendy@centrale-marseille.fr et lejeunes@lma.cnrs-mrs.fr)

Labex management (LabexConseilCoordination@irphe.univ-mrs.fr)