

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:

The supervisor's research work is focused on the experimental modeling of the behavior of cementitious materials undergone physicochemical and mechanical stresses. More specifically, the work is related to the: (1) Study of early and long-term behavior of cementitious materials : formulation, microstructure, delayed deformations, cracking, scale effects ; (2) Durability and resilience of cementitious materials by incorporation of mineral additions: formulation optimization, physicochemical characterization, transfer properties and mechanical behavior, aging and post-exposure resilience, performance indicators for the repair of structures.

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 :

Because of the environmental impact, it is crucial for the cement industry to reduce the carbon dioxide emitted during limestone decarbonisation. Indeed, this process consumes important amounts of energy and releases significant carbon dioxide content. One of the solutions proposed in the construction industry is the partial or total substitution of cement or clinker by secondary materials such as mineral additions (e.g. blast-furnace slag, fly ash, and limestone filler). This solution is more respectful of the environment and used in numerous applications such as structures subjected to slightly aggressive or extreme environmental conditions. However, some of these civil engineering structures presented cracking due to their delayed deformations (shrinkage, creep). Thus, a good knowledge of the creep behavior of these materials is essential to broaden their scope, seeing that this parameter affects seriously the material cracking sensitivity and the losses of prestressing. The main objective of the present PhD consists in studying and understanding the mechanisms driving the different types of creep (basic, thermal and total) by means of a large experimental campaign. Its implementation will require the development of original tests to monitor the thermal and tensile creeps. Based on these experimental results, rheological models and numerical codes proposed by standards would be adapted to predict the creep deformations of these friendly environmental materials.

Keywords :

Expected collaborations :

Background required from the applicant :

The skills required for this thesis are:

- Experience in the field of Civil Engineering
- A strong taste for laboratory experimentation
- Knowledge in mechanical experimentation

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

(see guidelines on the website www-csc.utt.fr)