

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:

Acoustic Characterization of complex materials, Acoustic propagation, Modelling of the acoustic wave propagation in materials,

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 :

Polymer materials are used in high technology applications (aeronautic structures, hydrogen tanks ...). They can be submitted to severe environmental conditions such as high temperature variations, huge mechanical loading. This results in a modification of the mechanical properties due to microstructure modifications induced by ageing in polymer material. The development of a new nondestructive characterization method of polymer ageing would be of a great interest for industrial applications. The propagation of acoustic waves depends greatly on the mechanical characteristics of materials. The measurement of the linear properties as celerity or attenuation or nonlinear parameter of the acoustic wave can be used to characterize the thermomechanical ageing of polymer materials. During this PhD thesis, polymer material samples will be submitted to a controlled thermomechanical ageing (high temperatures, mechanical traction and compression). This results in a modification of the microstructure of polymer material (anisotropy and cavitation appearances, breaking of macromolecular chains). An ultrasonic, mechanical and physicochemical characterization will be performed. These experimental approaches will be coupled to the modelling of the propagation of the acoustic wave in polymer material. An ultrasonic indicator of polymer ageing will be determined in order to develop new tools for polymer nondestructive testing.

Keywords :

Expected collaborations :

Background required from the applicant :

The applicant should have theoretical skills in materials science and in physical acoustics Good bases in signal processing and some experimental capabilities will also be essential.

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

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