

Research project offer



Location: ICA, Toulouse, France

Department: MS2M

Research group: COMET axis

Supervisor: Leonardo SANCHES, Raffaele D'ELIA, Guilhem MICHON

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OFFER DESCRIPTION

Title: Numerical modelling of polymer foam fabricated by extrusion assisted with supercritical CO₂

Proposed duration and period: 4 to 6 months ASAP

Context	Sandwich structures, which are widely used across various sectors, have the advantage of high stiffness-to-mass ratio. However, vibratory and acoustic issues have arisen, requiring additional constraints to be considered in the design of these structures, particularly in the selection of the core material. In this context, polymer foam can meet these constraints with its viscoelastic and porous properties. This topic comes into a support of a PhD Thesis which aims at establishing the correlation between the fabrication process variables with the mechanical and acoustic properties of the designed core material for sandwich structures.
Objectives and work	The objective of this topic is to conduct numerical simulations of a representative volume element of a polymer alveolar material. A parametric analysis of the developed model will be used to determine the effects of the microstructure in the mechanical and acoustic properties of the studied material. Experimental mechanical and acoustic tests will be conducted to validate the proposed model.

Possibility to continue with a PhD (Yes/No) : YES

REQUIRED APPLICANT PROFILE AND SKILLS

Study level (tick possible choices)	<input type="checkbox"/> Undergraduate students (3 rd or 4 th year) <input checked="" type="checkbox"/> Master students (1 st or 2 nd year) <input type="checkbox"/> PhD students
Required profile and skills	This offer is suitable to students in last year of MSc, MEng in Solids Mechanics, Structures Mechanics. The expected specific skills are : <ul style="list-style-type: none">• Fundamentals of strength of materials and viscoelasticity• Basics on the FE method• knowledge in acoustic is highly valuable
Other useful information	Feel free to take contact