

Infrared and visible deflectometry for full-field vibration imaging - Project #2

Record number : OPR-732

Overview

RESEARCH DIRECTION

Olivier Robin, Professeur - Department of Mechanical Engineering

ADMINISTRATIVE UNIT(S)

Faculté de génie
Département de génie mécanique

INFORMATION

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LEVEL(S)

2e cycle

LOCATION(S)

Campus de Sherbrooke

Project Description

PROJECT BACKGROUND AND OBJECTIVES: Deflectometry is a rapidly developing vibration imaging technique. Compared to traditional techniques, deflectometry allows to reach remarkable performances, with an improvement of both time- and space- resolutions by important factors (between 10 and 100 depending on the case). The feasibility of infrared deflectometry for dynamic measurements was demonstrated for the first time in 2021 at UdeS. The two objectives of the DÉFIVIB project are (1) to develop the level of technological maturity of deflectometry in the visible and infrared domains, and (2) to apply this technique to complex vibroacoustic problems (e.g., identification of the mechanical properties of wood, or the study of structured materials or metamaterials).

STUDENT ROLES AND IMPLICATIONS: The student will be responsible for the development and metrological validation of infrared (IR) deflectometry. The proposed topic involves two components: (1) the development of specific tools such as a grid that allows variable thermal contrast and samples with controlled surface roughness designed by 3D printing, and (2) the realization of measurements by IR deflectometry with the developed tools to estimate the performances and the limits of this technique.

The student will collaborate with other graduate students and co-supervise an undergraduate internship. This topic allows the development of skills in applied research, vibroacoustics and camera imaging. It is expected that the master's degree will take place mainly at the CRASH at the University of Sherbrooke. Free interdisciplinary courses may also be offered through the CR+.

Discipline(s) by sector

Sciences naturelles et génie

Génie mécanique

Funding offered

Yes

The last update was on 12 March 2024. The University reserves the right to modify its projects without notice.