



Doctoral school SPIM - science course 2015-2016

Acronym : SPIM-PHYSA	Physical acoustics: acoustic and elastic waves
Required prior knowledge	Basic wave physics, master level mathematics (for engineering), desktop computer usage
Form of examination	Synthetic written report at the end of the practical class
Keywords	Bulk and surface acoustic waves, physical acoustics, FEM
Learning outcomes	Working knowledge of acoustic waves in fluids and elastic waves in solids, in the light of applications to transducers and surface acoustic wave technology. <ul style="list-style-type: none"> - Introduction to physical acoustics. - Supervised exercises to practice the concepts explained during the lectures. - Supervised practical class to get hands on numerical simulation of acoustic and elastic waves. The goal is to give confidence to doctoral students that they can perform themselvesuch numerical simulations.
Content	<ul style="list-style-type: none"> - First Day, morning Lecture 1 (2:00): Acoustic waves in fluids Exercises 1 (1:30) - First day, afternoon Lecture 2 (2:00): Elastic waves in solids Exercises 2 (1:30) - Second day, morning Lecture 3 (2:00): Surface waves, plate waves, guided waves Exercises 3 (1:00) - Second day, afternoon Practical class: finite element computation of acoustic and elastic wave problems (under Comsol, 1 computer per participant) Explanations: <ul style="list-style-type: none"> - Lectures and exercises will be based on the book « Elastic waves in solids»By Royer and Dieulesaint, as a basis. - The lecturer has written a book on phononic crystals that also summarizes the topics of the lecture. - A previous version was taught by the lecture rat the master2 level and will serve as a starting point. - The lecturer has excellent working knowledge of Comsol numerical simulations applied to acoustic problems. He teaches a class on finite element simulation at the master level.
Instructor(s)	LAUDE Vincent (FEMTO-ST, MN2S, DR CNRS) http://members.femto-st.fr/vincent-laude/
Number of participants	Beetwen 8 and 20 participants
Hours	14h (Lecture cours: 6h + Exercices: 4h + Pract. Work, TP-projet:4h)
Calendar number of sessions, dates and times	1 session in 2015-2016: <ul style="list-style-type: none"> ↳ 15/04/2016 8:30-12:00 and 13:30-17:00 ↳ 22/04/2016 8:30-12:00 and 13:30-17:00
Location (room, building, adress, city)	FEMTO-ST (salle à déterminer - 3 premières demi-journées) - Besançon UFR ST Département Electronique (salle 217B) le 22/04/2016 de 13h30 à 17h00 - Besançon
Registration Procedures	by email to formations.doctorales@univ-fcomte.fr Your message MUST specify your Full name, graduate school, research team, the style of training and / the sessions you wish to register. If you are outside the UFC also indicate your year of thesis, the name of your manager and your home university. Registrations will be taken into account until three weeks before the date of formation within the limits of available seats. You will receive an acknowledgment of your request, then a notice by email approximately one week prior to training. WARNING: The courses are expensive, by registering, you agree to participate. If you are exceptionally ultimately unable to participate, be sure to inform as soon as possible.
Comments	Participants who have validated this course (registration at each session and validation rules as above) and who have completed the online survey will receive a certificate via email in the days / weeks following the training This training is open to doctoral students from other graduate schools. This course will be taught in English or French (depending on age) with course materials in English