

Aquitaine –Karnataka collaboration Scientific Project for Pre-PhD student exchange

Scientific Proposal

Project Title	Modelling ultrasonic scattering by inclusions	
Scientific domain	Acoustic wave propagation, ultrasounds, scattering, inclusions	
Summary (ca. 10 lines)	<p>The scattering of an ultrasonic wave by a distribution of inclusions is a scientific challenge finding many applications, e.g., design of functional structures for beamforming, signal compression or acoustic insulation. To comprehend the physical phenomena related to such problems and optimize the practical applications, it is first compulsory to run numerical simulations based on reliable, fast and efficient models. The purpose of this internship is to progress in the development of analytical solutions for the simulation of scattered fields. Many cases will be investigated from very simple and validation cases, e.g., one circular elastic inclusion in a perfect fluid, to gradually more complex cases, e.g., two or more circular elastic inclusions, then elliptical inclusion(s), first using 2D/3D models. A finite element –based model (Comsol Multiphysics) will be used as systematically as possible to compare with the analytical solutions.</p>	
Student profile wished	Candidates with good mathematical background and taste for numerical simulations are suitable for this project.	
Supervisor Name	Michel CASTAINGS & Christophe ARISTEGUI	
Supervisor @ & phone	@: michel.castaings@u-bordeaux.fr christophe.aristegui@u-bordeaux.fr	Tel: +33 5 4000 2463 +33 5 4000 3102
Institute/laboratory/industry (full address)	<i>Université de Bordeaux - I2M - Bât A4 351 cours de la Libération 33405 TALENCE Cedex, FRANCE</i>	
Director Name Institute/laboratory/industry	Eric ARQUIS	
Director Institute/laboratory/industry @ & phone	@: e.arquis@i2m.u-bordeaux1.fr	Tel: +33 5 4000 6687
Timing & duration for project (give approximate ranges)	January to June, inclusive – 6 months	
Representative References		

Contact Aquitaine: Erick Dufourc @: e.dufourc@cbmn.u-bordeaux.fr tél: +33 5 4000 6818	Contact Karnataka: Dipankar das Sarma @: sarma@sscu.iisc.ernet.in tél: +91 80 2293 2945
http://www.cbmn.u-bordeaux.fr/aquitaine-karnataka-exchange?lang=2	