

Prediction of noise generation from compliant coating excited by a turbulent boundary layer



NICOLAS BAUDIN
INTERNSHIPS IN FRANCE INITIATIVE

INSA Lyon + Naval Group

Name of the hosting institution in France	INSA Lyon - University of Lyon (in collaboration with Naval Group Research)
Name of the host laboratory / research team	Laboratory of Vibration and Acoustics (LVA)
Address	LVA - INSA Lyon - Univ Lyon Bat. Saint Exupéry 25 bis av. Jean Capelle 69621 Villeurbanne Cedex
Web site	http://lva.insa-lyon.fr/en/
Name of the supervisor	Laurent Maxit
Function	associate professor
Email	laurent.maxit@insa-lyon.fr

Internship offer

Topic of the internship (title) Prediction of noise generation from compliant coating excited by a turbulent boundary layer

Proposed dates of the internship **Start:** 2019-09-02 **End** 2020-02-28

Scientific and academic objectives of the internship (detailed description of the internship content, work expected from the intern and expected outcomes):

Study of noise and vibrations are of first importance for submarines. A solution for reducing noise and vibration consists in adding acoustic coatings to the outer hulls. In this study, the source of interest is the turbulent boundary layer and acoustic coating can consist in elastic multilayers. The prediction of its hydro-vibro-acoustic behaviour by analytical or numerical models is then of strong interest for the industry. The goal here is to study the hydrodynamic noise reduction induced by adding a coating on a rigid plate. Only a few studies in the literature have presented results when elastic multilayers are excited by a turbulent boundary layer. In the acoustic department of Naval Group Research, the internship consists in studying the hydro-vibro-acoustic behaviour of a submerged elastic multilayer elastic subjected to turbulent excitation in order to have a better understanding of the underlying physical phenomena and possible noise reduction. To achieve this, the literature will be studied and analytical model will be developed. The tasks are:

- Literature survey and use of previously developed models
- Development of an analytical method
- Understanding of the physical phenomena
- Application to academic test cases
- Summarize the developments and results in a report

Type of contract: Paid internship Duration of the contract: 6 months, Location: Ollioules (south of France)

Name of industrial partner	Naval-group research
Role of the industrial partner in the internship project	The topic was proposed by the industrial partner. The internship will take place in the facilities of Naval Group in Ollioules (South of France). The candidate will be part of the research group in acoustics. Different numerical tools will be provided to model the problem.
Main contact at the French industrial partner	Gilles Serre, gilles.serre@naval-group.com
Main contact at the French industrial partner's branch in Australia (if applicable)	Margaret Law, margaret.law@au.naval-group.com +61 08 7099 2166
Targeted Australian university	Any

Expected profile of applicant

Level of study	Master
Discipline	Mechanical engineering
Required qualities, knowledge and skills	The applicant must be a second year master student, in mechanical engineering with preferably an emphasis on acoustics and structural dynamics. The applicant should have the following skills: <ul style="list-style-type: none"> • Well organized • Autonomous at work • Technical and scientific rigor • Analytical mind • Matlab skills • Interest for research