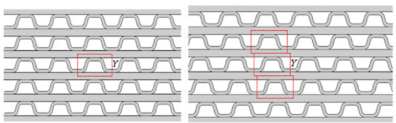
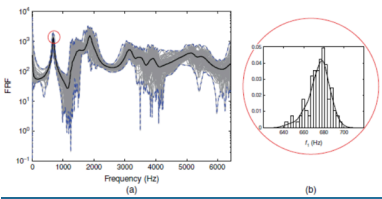
Invitation to participate in
2nd VIPER Summer School
« *Uncertainty propagation and stochastic methods* »

11-13 September 2017
Aula Bobbio, Engineering School,
Piazzale Tecchio, Napoli

Lectures on *UNCERTAINTY PROPAGATION AND STOCHASTIC METHODS*





Synopsis

Even the most accurate modelling of real systems possesses some degree of uncertainty associated to several input data. The two figures show a typical uncertainty in a honeycomb and the example of variability in the vibration response. The deterministic simulations of such systems lead to *nominal* solutions. Inside the VIPER project, special attention is devoted to the analysis of the uncertainties inside a structure and the subsequent need of stochastic methods for vibro-acoustic purposes. The school will offer a wide view around these specific themes and will welcome all PhD candidates interested in such fascinating but subtle matters. The summer school is jointly organized by UNINA and Lamiflex that will introduce experiences and themes close to the real applications and processes pointing to the industrial needs. The portfolio of the invited lectures/lecturers is open to the audience of Master and PhD students, engineers and researchers interested in vibroacoustics of periodic media: problems about "uncertainty", due to the lack of perfect periodicity either desired or not will be addressed in view of the manufacturing aspects of engineering applications of periodic media. The fundamental basis of these periodic media, their interest and their limitations will be presented.

Invited Speakers

Elena Ciappi
Senior Researcher – CNR-INSEAN, Rome (IT)
Expertise: Wave propagation and flow-induced vibration.

Alice Cicirello
Lecturer – University of Oxford (UK)
Expertise: Structural dynamics and uncertainty quantification.

Robin Langley
Professor - University of Cambridge (UK)
Expertise: Vibroacoustics and stochastic mechanics.

Brian R. Mace
Professor - University of Auckland (NZ)
Expertise: Structural dynamics and wave motion.

Mauro Maggioni
Engineer – Technical Director at Lamiflex (IT)
Expertise: Design & Manufacturing of Composite Materials.

Francesco Marulo
Professor - University of Napoli "Federico II" (IT)
Expertise: Structural Dynamics, Noise and Vibrations.

Bruno Toaldo
Researcher, University of Napoli "Federico II" (IT)
Expertise: Probability and Stochastic Methods.

PARTICIPATION

Participants from both the academia and the industry are welcome. Maximum number is 50.
Registration fee: 150 Euros, the registration includes coffee breaks, lunchs and course supports.
Full program available soon on : viper. ec-lyon.fr

CONTACTS

To participate or to have more information about this event, please contact **zsoka.bori@ec-lyon.fr** and/or **paola.muratto@unina.it**. A list of hotels in Napoli is available on request.

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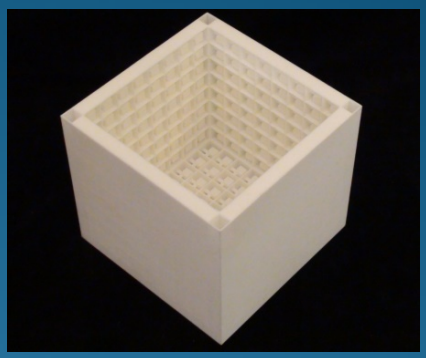
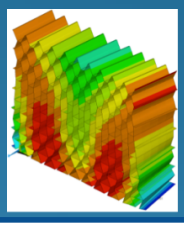
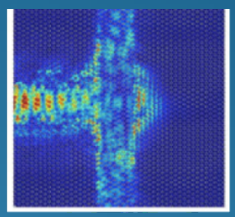
VIPER
VIbroacouctics in PERiodic Media

http://viper.ec-lyon.fr







VIPER is a European Joint Doctorate on Vibroacoustics. VIPER aims at consolidating academic research dealing with VIbroacoustics of PERiodic media. Structural periodic design is a powerful strategy for lightweight structures achievements while remaining a convenient solution for manufacturing guidelines aspects. Including vibroacoustic design rules at early stage of products development is one of the main research targets. Periodic media exhibit proper dynamic filtering effects that can be smartly used for vibroacoustic design. The question addressed then is simple: how periodic concepts can improve the broadband vibroacoustic signatures and performances? Most of vibroacoustic treatments are frequency band limited. Indeed, on the one hand, viscoelastic materials (for instance) can be used for low frequency passive vibration control. On the other hand, poroelastic blankets are efficient for high and mid frequency absorption of acoustic disturbance. Newly and extensively employed lightweight structures present a strong dynamical overlapping between low, mid and high frequency bands that needs to be dealt with.

The VIPER project' main goal is to develop and to validate tools for the design of global vibroacoustic treatments based on periodic patterns allowing passive control of vibration and acoustic paths in layered concepts. This will be achieved by addressing in-depth structural periodicity stiffness as well as absorption attributes. The proposed concepts would ensure a significant improvement of vibroacoustic performances in a wide frequency range. Dealing with large scale periodic structural-acoustic concepts involves a multi-scale aspect that needs specific numerical tools. A two scale strategy will be pursued in most of the achievements to handle periodicity effects: the meso-scale is related to the elementary cell or the span, while the macroscale relates to the full-size structure. Each scale will be characterized by its own efficiency indicators: effective parameters (mechanical and acoustical equivalent material properties, dispersion characteristics…) at the meso-scale, and vibroacoustic indicators (structural damping, acoustic absorption, transmission loss…) at the macro-scale.

KU LEUVEN · ÉCOLE CENTRALE LYON · UFC UNIVERSITÉ DE FRANCHE-COMTÉ · University of BRISTOL · Università degli Studi di Napoli FEDERICO II

European Commission

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