סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות **במסגרת הדוקטורט**

שתתקיים ביום ב׳ 2.11.2020 (ט״ז בחשון, תשפ״א), בשעה 13:30 באמצעות הזום :

https://technion.zoom.us/j/92994760004

מרצה : יואב ורד

מנחה : פרופ׳ יצחק בוכר

על הנושא :

Decomposing and controlling dispersive propagation modes in acoustic-elastic waveguides at low frequencies

applications to acoustic properties evaluation

The seminar will be given in English

תקציר ההרצאה :

The research develops tools to estimate acoustical properties of materials from measured data under ill-posed conditions, with emphasis on fluidic media, low frequency, and long wavelengths. When considering fluids, the acoustic properties are measured using an impedance tube. Most standardized methods ignore the interaction between the elastic tube and the acoustic fluidic medium, which leads to inaccurate properties estimation. Shown are new methodologies and methods to estimate the dynamics of the coupled impedance tube that overcomes the ill-posed nature of the identification.

Using a boundary perturbation method, a complete pressure model is fitted with clear physical interpretation. An extensive error analysis is carried, and on its basis, solutions are drawn to minimize the identified parameters uncertainty bounds. Beyond the specific physical experiment and phenomenon, the developed methods are valuable for all propagating wave phenomena in coupled physical domains and waveguides.

Several experimental impedance tubes were developed to support the theoretical research, to verify the model extraction methods, and to realize the proposed methodologies. The main innovation relies on transducers at both tube's ends. The latter enables stable extraction of the acoustic properties at low frequencies; active control of the waves along the tube; and the estimation of the required acoustical properties under multiple-wave propagation.

The outcome of the research opens a path to modeling long wavelength, coupled waves in a dispersive medium, and a formulation of the mathematical and numerical methodology to achieve these goals. A comprehensive experimental verification was run successfully to verify and refine the theory.

בברכה,

מרכז הסמינרים