



Department of
Mechanical Engineering
The University of Hong Kong



SEMINAR

Broadband and Adjustable Noise Control with Shunted Electro-mechanical Diaphragm

- Date:** 26 April, 2023 (Wednesday)
Time: 9:30 a.m.
Venue: Room 7-34, Haking Wong Building, HKU
- Speaker:** Miss HAN Xue (PhD candidate)
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Abstract:

The traditional acoustic resonator only has good performance near the resonant frequency. Resonator array is often used to widen the sound absorption band, but its performance is still limited by the volume and cannot cope with the changing sound source due to its fixed shape. A shunted, electro-mechanical diaphragm (SEMD) can serve as an effective sound-absorbing device and adapt to a changing environment. Due to the Lorentz force, the electrical impedance of the shunted circuit is strongly coupled with the mechanical impedance of the diaphragm. Adjusting the electrical impedance of the circuit can change the acoustic impedance of the SEMD, then the sound absorption coefficient of the SEMD can be adjusted to any specific spectral content of the incident sound. On this basis, a shunt analogue circuit is periodically connected and disconnected by a MOSFET. The electric resistance of the circuit varies repeatedly between very low and very high values, causing partial incident sound energy to scatter to other frequencies, which provides a novel idea of noise control. It expands the effective bandwidth of the sound absorber and is easily adaptable to a changing source spectrum.

ALL INTERESTED ARE WELCOME

For further information, please contact Prof. L.X. Huang at 3917 2627.