



香港聲學學會

Hong Kong Institute of Acoustics

HKIOA TECHNICAL WEBINAR ACOUSTIC METAMATERIAL SERIES

14, 21 & 28 July 2021

7:00pm – 8:15 pm (Reception starts at 6:30 pm)

Free of charge

Seminar 1:

- Product Development from Membrane-type Locally Resonant Acoustic Metamaterials
14 July, 2021 7:00 pm - 8:15 pm (1 CPD Hour)
Venue: Lecture Theatre K (Tentative), HKUST
(Free parking with registered car plate)
Online: ZOOM Conference Room

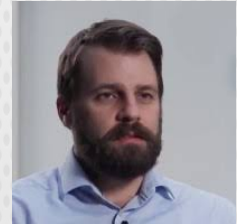


Prof. Zhiyu YANG

Professor in the Physics Department of HKUST,
CEO of Tranquility Acoustronics (HK) LTD

Seminar 2:

- The Genesis and Development of The KEF LS50 Meta
21 July, 2021 7:00 pm - 8:15 pm (1 CPD Hour)
Online: ZOOM Conference Room



Dr Sébastien DEGRAEVE

Senior Research and Development Engineer at KEF

Seminar 3:

- Attempting Acoustic Metamaterial Liners for Duct Flow Silencer Design
28 July, 2021 7:00 pm - 8:15 pm (1 CPD Hour)
Online: ZOOM Conference Room

Mr Racer K. H. LAM

Dr Randolph C. K. LEUNG

Department of Mechanical Engineering
The Hong Kong Polytechnic University

Registration

Interested members please fill in the registration form via <https://forms.gle/M2TVQK8t6sNeZHgv9> by 12 July. The ZOOM broadcast link will sent to your registration email address once your seat is confirmed.





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Acoustics Metamaterial – Locally Resonant Membrane-type Noise Barriers and Ventilation Silencers

This seminar is the first of the **Acoustics Metamaterials Seminar Series**. Metamaterials are functional structures engineered to have the properties that are well beyond the constituent materials. They are made from assemblies of elements fashioned from single or multiple materials into different orientations, shapes and sizes from which the properties of the metamaterials are derived.

Seminar Detail

Date and Time:	14 July 2021 (Wednesday) 6:30 – 7:00 pm: Reception and Registration 7:00 – 8:00 pm: Seminar 8:00 – 8:15 pm: Q&A Session
Seminar Venue:	Lecture Theater K (Tentative), HKUST
Live Broadcast:	ZOOM (Link to be announced later)
Language:	Cantonese/English
CPD:	1 CPD hour
Fee:	Free of charge
Enquiry:	admin@hkioa.org

Registration (for both Seminar or Live Broadcast):

Please complete the online registration by 12 July 2021 (Monday).

<https://forms.gle/M2TVQK8t6sNeZHgv9>



Speaker

Prof. Zhiyu Yang is a Professor in the Physics Department of HKUST and CEO of Tranquility Acoustronics (HK) LTD. After 20 years research on the membrane-type locally resonant acoustic metamaterials at HKUST, Prof. Yang has developed **Light-weight Noise Barrier Panels** and **Super-function Silencers**, which are suitable for noise control applications that have strict restrictions on weight reduction and space. Compared to the conventional products on the market, the metamaterials products are smaller in volume and lighter in weight for the same degree of noise reduction, or are able to provide higher noise reduction within the same space and weight limit, while at competitive price.

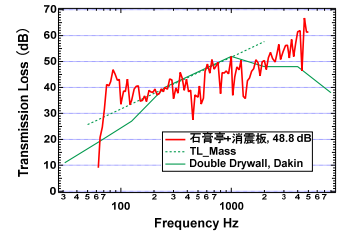
Brief Information on the Products:

Hard panel noise barriers:

Thickness 10 – 20 mm, Weight 5 – 15 kg/m², Additional insertion loss 10 – 25 dB at 50 – 10000 Hz when mounted on existing walls.

Applications:

Partition walls, floors, ceilings, retractable ceiling of large stadium.

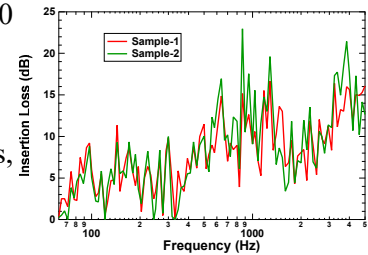


Foldable noise barriers

Thickness 5 – 50 mm, Weight 2 – 15 kg/m², Insertion loss 5 – 25 dB at 100 – 10000 Hz.

Applications:

Construction site; large machines; tarpaulin for large halls; hotels; offices, flats.



Silencers without rock wools

Frequency Range:

250 – 10000 Hz,

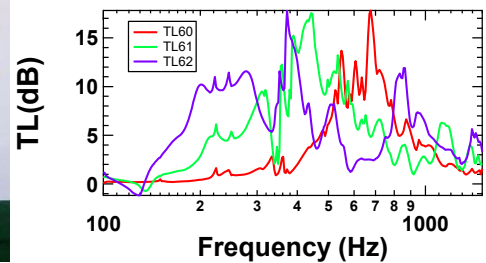
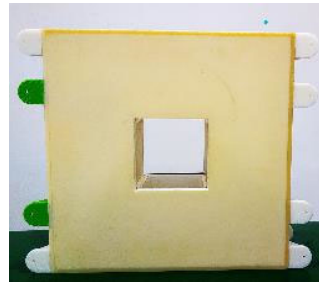
Air channel lateral side length:

10 – 200 mm,

Air channel longitudinal length:

50 – 1000 mm.

Negligible air resistance.



Low-Frequency Silencers without rock wools

Frequency Range:

100 – 10000 Hz,

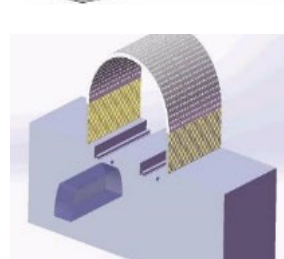
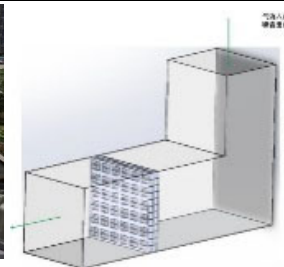
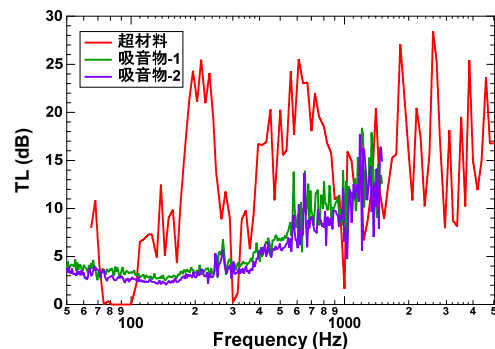
Air channel lateral side length

130 mm,

Air channel longitudinal length:

100–1000 mm.

Air resistance loss factor K_l less than 12.





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HKIOA TECHNICAL WEBINAR ACOUSTIC METAMATERIAL SERIES

- SEMINAR 2

THE GENESIS AND DEVELOPMENT OF THE KEF LS50 META

21 JULY, 2021 7:00 PM - 8:15 PM (1 CPD HOUR)

ONLINE: ZOOM CONFERENCE ROOM

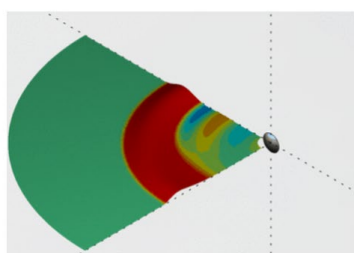
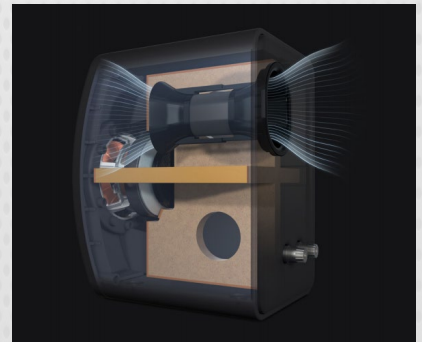
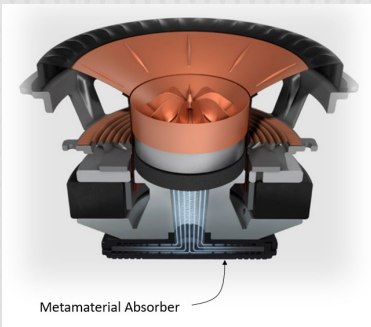
Speaker:



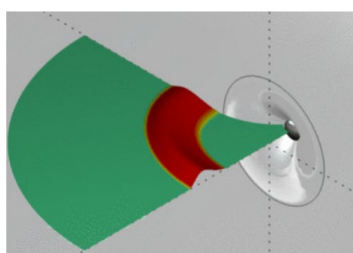
Dr Sebastien Degraeve graduated from Le Mans University with a MSc in Acoustics in 2008 and received his PhD in Acoustic Metamaterials in 2013. After 4 years working as a Scientist on fluid-structure interaction models in Cambridge (UK) and gaining a strong expertise in Finite Element Analysis, he joined KEF in 2018 to fulfil his passion for loudspeaker engineering. As part of the R&D team, Sebastien is now a Senior Research & Development Engineer and his main interest is on new technologies. He is the co-inventor of the Metamaterial Absorption Technology and is involved in many research projects.

Description:

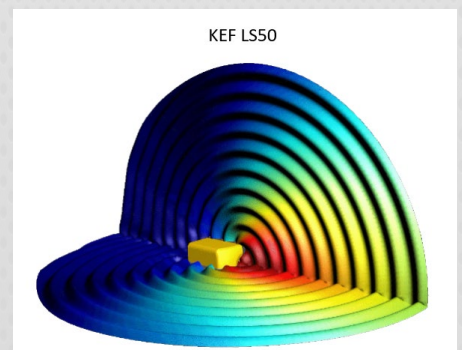
The seminar introduces the journey of designing a masterpiece loudspeaker LS50, discusses the deep understanding on the structure-acoustics interaction of the loudspeaker components as well as the room acoustics. The loudspeaker design performance is evaluated thoroughly from component level to assembly level with computer simulation and experimental measurement. The sound quality of the LS50 is being push further beyond the limit with acoustic metamaterial absorption technology.



Tweeter directly on infinite plane



Optimised waveguide design for Uni-Q



KEF LS50