

Zibo Liu

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RESEARCH FIELD, EXPERTISE AND SKILLS

Keywords: “**acoustics; vibroacoustics; wave propagation; analysis of mechanical/acoustic properties; sound insulation and absorption; sound radiation; structural analysis; Finite Element method; signal analysis, acoustic measurement**”

Interested in the vehicle, aeronautical/aerospace engineering or the related fields, for acoustic analysis, NVH control, active and passive noise control, vibration isolation, noise reduction, modal analysis, *etc.*, in order to design, analyze, and improve the corresponding acoustical systems.

EDUCATION

- SEP. 2014 – MAR. 2019 **Doctor of Philosophy**
STOCKHOLM, SWEDEN
Department of Aeronautical and Vehicle Engineering
KTH Royal Institute of Technology
- SEP. 2011 – JUN. 2014 **Master of Science**
CHANGSHA, CHINA
Theoretical Acoustics
National University of Defense Technology
- SEP. 2007 – JUN. 2011 **Bachelor of Engineering & Bachelor of Business Administration**
BEIJING, CHINA
Applied Mechanics & Business administration
Beijing Institute of Technology

SCIENTIFIC PAPERS

- [1] **Liu, Z.**, Rumpler, R. and Feng, L., 2020. Locally resonant metamaterial curved double wall to improve sound insulation at the ring frequency and mass-spring-mass resonance. *Mechanical Systems and Signal Processing*, 149, p.107179. doi: 10.1016/j.ymssp.2020.107179
- [2] **Liu, Z.**, Rumpler, R. and Feng, L., 2019. Investigation on sound transmission through a locally resonant metamaterial cylindrical shell. *Journal of Applied Physics*, 125, 115105(2019). doi: 10.1063/1.5081134
- [3] Song, Y., Feng, L., **Liu, Z.**, Wen, J. and Yu, D., 2019. Suppression of the vibration and sound radiation of a sandwich plate via periodic design. *International Journal of Mechanical Sciences*, 150, pp.744-754. doi: 10.1016/j.ijmecsci.2018.10.055
- [4] **Liu, Z.**, Rumpler, R. and Feng, L., 2018. Broadband locally resonant metamaterial sandwich plate for improved noise insulation in the coincidence region. *Composite Structures*, 200, pp.165-172. doi: 10.1016/j.compstruct.2018.05.033

WORK EXPERIENCE

- School of Materials, Sun Yat-sen University, Guangzhou, China
External researcher
Research on the application of acoustic metamaterials.
SEP. 2020, CURRENT (PT)
- Department of Mechanical Engineering, Tsinghua University, Beijing, China
External researcher
Tribological behaviour of a diesel engine and engine sealing project.
JUL. 2020, CURRENT (PT)
- Institute of Acoustics, Tongji University, Shanghai, China
Research engineer
DEC. 2019, CURRENT (PT)

Modeling the sound insulation performance of the multilayer systems.

JUL. 2019, JAN. 2021 (FT)

Yi Duo Information Technology Co., Ltd. (Shanghai), Shanghai, China
Senior acoustic consultant, Project manager

Develop pipeline jackets for nuclear power plant in order to achieve integrated function of thermal insulation and noise reduction as a part of the National Major Project Research of China.

DEC. 2018 – JUN. 2019 (PT)

KTH Royal Institute of Technology, Stockholm, Sweden
Research engineer

Study the acoustic properties of metamaterials to develop applications in sound insulation engineering; laboratory assistant at Marcus Wallenberg Laboratory for Sound and Vibration Research(MWL).

PROJECT EXPERIENCE

SEP. 2020 – CURRENT

Research on the potential applications of acoustic metamaterials
School of Materials Sun Yat-sen University

Explore the possibility of realizing acoustic metamaterials. Develop the potential applications of acoustic metamaterial.

JUL. 2020 – CURRENT

Tribological behaviour of a diesel engine
Weichai Power Co., Ltd & State Key Laboratory of Tribology, Tsinghua University

Improve the tribological behaviour of a diesel engine by improving its sealing performance.

JUN. 2019 – JAN. 2021

Research on the Noise and Vibration Control of the Pipelines for Nuclear Power Plant
National Science and Technology Major Project. Yi Duo Co., Ltd.; Tongji University & Shanghai Nuclear Engineering Research and Design Institute

NVH control of the pipeline for the nuclear power plant. This project is a part of the National Science and Technology Major Project, under the Project Number ZDo8-212-002-002, funded by China Innovation Funding.

DEC. 2018 – JUN. 2019

Acoustic metamaterials
MWL, AVE, KTH

Investigations on the properties of acoustic metamaterials in order to develop more applications for practical engineering.

SEP. 2016 – MAR. 2019

Design of soundproof panels via metamaterial concept
PhD project at MWL, AVE, KTH

Investigation on the acoustic properties of metamaterial panels, especially with the application to sound insulation.

OCT. 2018 – FEB. 2019

Analysis and design of sandwich structures
Lightweight structures group, AVE, KTH

The project aims at investigating and improving the sound transmission loss properties of sandwich structures. A solution is proposed to the coincidence effect of sandwich structures.

SEP. 2016 – MAR. 2017

Roll2Rail Project
Hitachi Rail Italy & MWL, AVE, KTH

The Roll2Rail project aims to develop key technologies for radical innovation in the field of railway vehicles. As part of this project, Zibo simulated the sound transmission loss property of the cabin of a train under the supervision of Dr. Roman Rumpfer.

SEP. 2015 – JAN. 2016

Acoustic properties of porous materials
MWL, AVE, KTH

The project aims to study the acoustic properties of porous materials. Biot's theory was studied through the project. A theoretical basis

for the core design of the further sandwich structure is provided.

JAN. 2015 – MAY 2015

Structural analysis of GKN driveline

GKN Driveline & MWL, AVE, KTH

The modal analysis of a GKN driveline was carried out. Eigenmodes and eigenfrequencies are predicted theoretically and then tested experimentally.

CONFERENCES

- 2018 JUL. ICSV 2018, Hiroshima, Japan
Oral presentation & published paper
Investigation on the acoustic behaviour of the locally resonant metamaterial curved panel
- 2017 JUN. Acoustics'17, Boston, Massachusetts
Oral presentation & published abstract
Design of broadband acoustic metamaterials for low-frequency noise insulation *JASA*, 141(5), pp.3574-3574.
- 2016 JUN. BNAM 2016, Stockholm, Sweden
Oral presentation & published paper
A finite element model for the vibro-acoustic analysis of plates and sandwich structures
- 2014 DEC. SAPEM 2014, Stockholm, Sweden
Attendance & organizing committee

SEMINARS

- 2019 FEB. AVE KTH, Stockholm, Sweden
Lecture on the acoustic properties of sandwich
- 2018 DEC. ABB, Västerås, Sweden
Introduction to the acoustic metamaterial
- 2017 DEC. MWL Annual, Stockholm, Sweden
Introduction to the research progress
- 2017 DEC. AVE Department Seminar, Stockholm, Sweden
Metamaterial sandwich plate for noise insulation
- 2016 DEC. MWL Annual, Vaxholm, Sweden
Introduction to the research progress
- 2015 DEC. Bombardier Transportation, Västerås, Sweden
Introduction to the research on sound insulation

AWARDS

- 2014 **CSC Scholarship**
China Scholarship Council
- 2011 **Excellent Graduate**
Beijing Institute of Technology

INTERESTS

a) Engineering mathematics and physics; b) Computer science, machine learning; c) Historical and political books/talks; d) Piano, Running.

REFERENCES

Dr. Leping Feng

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EMPLOYER Department of Aeronautical and Vehicle Engineering
KTH Royal Institute of Technology
EMAIL fengl@kth.se

Dr. Romain Rumpler

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EMPLOYER Department of Aeronautical and Vehicle Engineering
KTH Royal Institute of Technology
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Dr. Qi Li

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EMPLOYER Yi Duo Information Technology Co., Ltd.(Shanghai)
EMAIL liqi@yiduo-tech.com

Dr. Wuzhou Yu

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EMPLOYER Institute of Acoustics, Tongji University
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Dr. Dameng Liu

POSITION Associate Professor
EMPLOYER Department of Mechanical Engineering, Tsinghua University

Dr. Bin Li

POSITION Professor
EMPLOYER School of Materials, Sun Yat-sen University