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Recent progress in acoustic meta-material membranes for low frequency sound attenuation

Low frequency noise has long been regarded as a form of noise pollution due to its high penetrating power. The reduction of low frequency noise from aircraft and automobile engines remains a challenge, since the conventional acoustic liners are not able to absorb the low frequency noise radiation. Membrane-type acoustic metamaterials (MAMs) have demonstrated unusual capacity in controlling low-frequency sound transmission and reflection. The MAM is composed of a pre-stretched elastic membrane with attached rigid masses. In this keynote paper, the problems associated with low frequency noise will be discussed. The recent analytical/computational/experimental research on acoustic metamaterial membranes in controlling and attenuating the low frequency noise will be presented.

Biography

Ramesh K Agarwal is the William Palm Professor of Engineering at Washington University in St. Louis. From 1994 to 2001, he was the Sam Bloomfield Distinguished Professor and Executive Director of the National Institute for Aviation Research at Wichita State University in Kansas. From 1978 to 1994, he worked in various scientific and managerial positions at McDonnell Douglas Research Laboratories in St. Louis. He became the Program Director and McDonnell Douglas Fellow in 1990. He received PhD in Aeronautical Sciences from Stanford University in 1975, MS in Aeronautical Engineering from the University of Minnesota in 1969 and BS in Mechanical Engineering from Indian Institute of Technology, Kharagpur, India in 1968. He is the author and coauthor of over 500 publications and serves on the editorial board of 20+ journals. He has given many plenary, keynote and invited lectures at various national and international conferences worldwide. He is a Fellow of AAAS, ASME, AIAA, IEEE, SAE and SME.

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