



Acoustic Metamaterials and Acoustic Foams: Recent Advances

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Message from the Guest Editors

Dear Colleague ,

Acoustic metamaterials are synthetic materials made of repeating unit cells which are designed to address an acoustic problem by the rational design of their micro-features. The characteristics of acoustic metamaterials are dominated by their rationally designed microarchitecture rather than the base material. Particularly, acoustic metamaterials can manipulate sound and elastic waves both spatially and spectrally in unprecedented ways. This class of materials did not exist until recently, as manufacturing their complex features was either impossible or prohibitively expensive. Recent advances in additive manufacturing (3D printing) have made it possible to manufacture such constructions with complex internal geometries and at much lower cost. Even though acoustic metamaterials are becoming more and more prevalent in academic and industrial sectors, acoustic foams have still kept their importance in addressing noise issues, due to their relatively low cost and high noise mitigation performance.

Keywords: noise control; acoustic metamaterials; broadband noise attenuation; additive manufacturing; acoustic foams; 3D printing;





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