

From metaporous materials to subwavelength absorbers: some recipes to design perfect sound absorbers

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Abstract— A perfect absorber, i.e., a structure which absorbs 100% of the incident acoustic energy, of very small thickness is of great scientific and engineering interest. Until now, porous or fibrous materials have been the common choice for noise passive control due to their ability to dissipate sound through thermal and viscous losses. This results in limitations: to absorb low frequency sound, bulky and heavy treatments are required even when optimized multilayer or graded materials are used. For many years the development of noise reducing treatments has been the subject purely of acoustics research. However, recent scientific advances provide a unique and timely opportunity to bring about significant improvements in the design of noise treatments. This presentation aims at giving an overview of some solutions that have been recently developed in LAUM to tackle the problem of sound absorption by rigidly backed subwavelength structures.