

A Method And Apparatus to Attain Acoustic Transmission Loss Using Metamaterial

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Inventors: Anil Pundir, Dr. Arpan Gupta, Dr. Sarthak Nag

ABSTRACT

A method (200) to attain acoustic transmission loss using metamaterial (110) may be provided which may include forming (112) a scatterer array (102) in a matrix material. The metamaterial (110) may be the combination of the scatterer array (102) and the matrix material. The scatterer array (102) may have a plurality of scatterers (114). Further, the method may include placing (116) the scatterer array (102) between a sound transmitter/source and a sound receiver/sink and moving (118) the plurality of scatterers (114) of the scatterer array (102) in angular, radial inward and outward directions to secure a suitable position to attain acoustic transmission loss. The scatterer array (102) in a matrix material may work as acoustic barrier and acoustic switch upon the movement (118) of the plurality of scatterers (114) in angular, radial inward and outward direction.

KEY APPLICATION AREAS

1. Acoustic metamaterials.
2. Noise control and sound insulation.
3. Architectural acoustics.
4. Industrial noise mitigation.
5. Automotive and aerospace acoustics.
6. Smart acoustic devices.

POTENTIAL USES

1. Tunable acoustic barriers and soundproofing systems.
2. Adaptive noise control across different frequencies.
3. Acoustic switches for dynamic sound transmission control.
4. Noise reduction in buildings, vehicles, and industrial equipment.

5. Programmable acoustic wave manipulation.

6. Advanced metamaterial-based sound attenuation systems.