

Energy Harvesting Active Acoustic Metamaterial-Device

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ABSTRACT

An apparatus and method for determining tensile strength of a soil specimen are disclosed. The apparatus comprising: a base plate (101); a plurality of iron plates (102) positioned on the base plate (101); a tensile mould (107) and a compaction mould (108) positioned on the base plate (101) and between the iron plates (102); and a pair of electromagnetic solenoids (104) arranged diagonally relative to the base plate (101); wherein the solenoids (104) generate a magnetic field to attract the plurality of iron plates (102) and hold the tensile mould (107), compaction mould (108), and base plate (101) together.

KEY APPLICATION AREAS

1. Acoustic energy harvesting.
2. Noise control and sound insulation.
3. Acoustic metamaterials and smart surfaces.
4. Adaptive acoustic switching and transmission systems.
5. Industrial and transportation acoustics.

POTENTIAL USE

1. Harvesting electrical energy from industrial machinery, vehicle, HVAC, and aircraft noise.
2. Smart acoustic barriers for factories, transport cabins, and buildings.
3. Programmable acoustic switches and sound-routing systems.
4. Low-frequency noise mitigation (<500 Hz).
5. Self-powered acoustic sensing and monitoring systems.