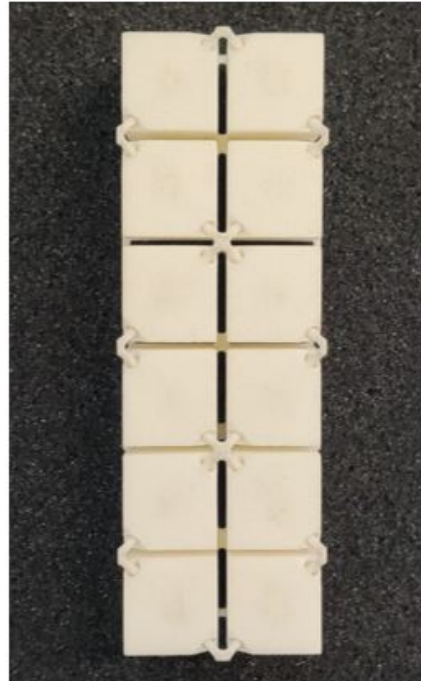


METASTRUCTURE FOR VIBRATION ISOLATION



The invention consists of a metastructure designed to ensure vibration isolation over a wide frequency range. This metastructure is a periodic structure which, thanks to the wide bandgap that characterizes it, that is the frequency range where the propagation of elastic / acoustic waves is inhibited, can be used in numerous applications where the ability to isolate vibrations is required.



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KEYWORDS:

Bandgap, Metastructure,
Vibration isolation.



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METASTRUCTURE FOR VIBRATION ISOLATION

DESCRIPTION

The metastructure, currently a functioning prototype, presents an innovative geometry developed by exploiting the mode separation technique, already known in literature. The unit cell is cubic, symmetrical on the diagonal planes, formed by pyramidal masses and cylindrical elastic elements connected to the center of the cell. The pyramidal masses are 4 and are placed in pairs, on the two opposite edges, so as to cover for the most part the volume of the elementary cube. The pyramidal elements are connected together by septa and in the center by elastic elements of a cylindrical shape. The supercell is made up of 8 elementary cells and is obtained by symmetry by mirroring the latter with respect to the faces of the elementary cube.

APPLICATIONS

- Vibration isolation systems;
- Hand-held type measuring instruments.

ADVANTAGES

- Can be made in different materials, including recycled ones, through 3D printing, thus making it easy to manufacture and customize;
- By changing the size of the unit cell and the number of unit cells contained in the metastructure, it is possible to change the frequency range where vibration isolation occurs and the effectiveness of the insulation.

