

## عنوان مقاله:

SINGLE-PHASE METAMATERIAL (SPM) AS A DISSIPATER FOR ATTENUATION OF VIBRATION IN TWO-DIMENSIONAL ELASTODYNAMICS PROBLEMS

## محل انتشار:

هشتمین کنفرانس بین المللی زلزله شناسی و مهندسی زلزله (سال: 1398)

تعداد صفحات اصل مقاله: 2

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## خلاصه مقاله:

The propagation of waves at different frequencies can be controlled using metamaterials. In general, a metamaterial cell consists of an inner core with a large mass and a high hardness and an external sheath with low mass and stiffness. These cells are arranged to form an interconnected chain and cause a reduction in vibration by creating a frequency vacuum. In 2014, the laboratorial investigations of Yan and colleagues in the field of implementing metamaterials in structure's foundation indicate appropriate performance of this system. In 2017, Maleki and Khodakarami (2017) investigated the use of metamaterial in soil to improve seismic performance and reduce in topography vibration. Wagner et al. (2016) investigated a more accurate examination on the use of metamaterials presented relations for the calculation of the frequency vacuum band that causes the vibration reduction. Single phases are another type of metamaterials, in which the inner core and its outer sheath are of the same kind, and the creation of specific geometries has caused the formation of metamaterial cells. Figures 4, 5 and 6 have investigated the use of single-phase metamaterials to reduce the variation. This study investigated the use of SPM to reduce the vibration of a steel plate. The creation of SPM matches the general principles of metamaterials based on the existence of an internal core and an external sheath on steel plates is done using CNC cutting. An example of SPMs is shown in Figure 1. The method of conducting research in finite element software is that a rectangular steel plate with dimensions of 165×105 mm has been investigated by the fixed boundary conditions in two length (see Figure 3). A stimulation according to Figure 2 has been applied to the median 1/3 of the plate's width, and the responses are taken on the other side.

## کلمات کلیدی:

Metamaterial, Single phase, Attenuation, Frequency gap, Wave propagation

## لینک ثابت مقاله در پایگاه سیویلیکا:

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