The effect of symmetry on the band structure of two-dimensional phononic crystal

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Abstract

In this paper, three types of two-dimensional phononic crystals comprising of steel rods (with circular, square, and triangular cross-sections) in water-ground matter were investigated. The frequency band structure for the x-y mode was calculated using Finite Element Method. What the results show complete and incomplete gaps for phononic crystals with a circular and triangular cross-sections and for the square cross-section an incomplete gap appeared. The results show the maximum intensity for phononic crystal with circle, square and triangle cross section, 1.15 MHz, 1.11 MHz and 1.27 MHz, respectively. The effect of change of source distance to sheet, effect of sheet thickness change on focal point intensity and focal point distance to source were investigated. In general, the obtained results are in good agreement with other existing results.

Keywords: Phononic crystals, Band gap, simulation.

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