

Instability Induced Patterns of 2D Soft Phononic Materials

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Abstract

Soft materials with periodic structures have attracted significant attentions in the recent several years, due to their abundant physics and potential applications as phononic crystals, such as wave filter, wave guiding, wave directionality and vibration isolator etc. The instability induced patterns and the pre-stress can effectively change the distribution of band gaps and the directionality of wave propagation, which can be reversibly manipulated through the mechanical loads. The aim of our research is to preliminarily study the effects of structural topology, microscopic size and mechanical load on the instability induced patterns and the pre-stress, and the consequent distribution of band gaps for 2D soft phonoic materials, which can help to improve the design of corresponding devices in the future.

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