The effect of Kohn anomalies on the phonon transport of a mass-spring chain

H Rabani1,2, M Mardaani1,2, and F Soleymani-fard1
1. Department of Physics, Faculty of Science, Shahrekord University, P. O. Box 115, Shahrekord, Iran
2. Nanotechnology Research Center, Shahrekord University, 8818634141, Shahrekord, Iran
E-mail: rabani-h@sci.sku.ac.ir

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Abstract

In this paper, we investigate the phonon transmission coefficient of a mass-spring in the presence of Kohn interaction by using Green’s function method within the harmonic approximation. This system is embedded between two simple phononic leads including only the nearest neighbor interactions. The results show that the presence of Kohn and the nearest neighbor interactions in the center wire makes a difference between the physics of center wire and leads. This causes some peaks and valleys to appear in the phonon transmission coefficient spectrum.

Keywords: phonon transport, Kohn anomaly, Green’s function, harmonic approximation

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